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Service Retention Forecasting in the Wireless Telecom Industry Using Limited Information

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Abstract

Understanding which timing models best forecast customer survival rates is of paramount importance across a range of marketing-related activities. The author analyzes the postpaid subscriber bases of U.S. wireless providers in order to determine which forecasting models best capture the underlying cohort dynamics across carriers. In doing so, he examines the degree of heterogeneity, duration dependence, seasonality, contractual expirations, and cross-cohort differences in these subscriber bases. The author compares the accuracy of these models both in-sample and out-of-sample. The in-sample parameters are calculated through ordinary least squares, given that—as an external constituency—the author must utilize limited information data structures.

The results appear to be more conclusive for certain carriers than others; that is, the best in-sample timing models are not always the best out-of-sample, and often times appear to considerably “overfit” the data. The meager historical data available to test these models is most likely to blame. However, the models developed do provide general framework through which to apply these methods to contractual settings as more data becomes available.

Keywords

service retention, proportional hazards model, limited information data structures

Disciplines

Business

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1 Introduction

A strong managerial interest has been brewing to link customer relationship management (CRM) with long-term financial objectives. At the crossroads of that pursuit is the notion of customer lifetime value (CLV), the present value of the future cash flows associated with a customer. Improvements to how managers approach the lifetime value of a customer would be extremely valuable. At a firm-wide level, it could provide a customer-centric approach to valuation and capture many of the intangible disregarded by more conventional approaches (e.g., Amir and Lev 1996), as well as provide guidance on the valuation of high-growth, early-stage firms with negative earnings (e.g., Gupta et al. 2004). At the managerial-level, it would provide better guidance on the true “ceiling” of per-unit advertisement costs, which has been

shown to be systematically underestimated when disregarding heterogeneity (Fader and Hardie 2010). The formula for CLV is captured by the equation below:

$$E(CLV) = \int_0^{\infty} E[v(t)]S(t)d(t)dt,$$

Where $E[v(t)]$ is the expected value of the customer at time t , $S(t)$ is the probability that the customer has remained active to at least time t , and $d(t)$ is the discount factor reflecting the present value of the money received at time t .

The focus of this paper will be improvements to the retention rate component of CLV, $S(t)$, by incorporating heterogeneity into forecasting models. The analysis is limited to retention rates because it is not possible to fully leverage the predictive power of marketing-related probability models as an external constituency. As an internal constituency, for example, one would be privy to specific unit-level data (such as customer tenure) that would allow for the implementation of empirical Bayes. Unfortunately, this is not publicly disclosed across the telecommunications industry under Generally Accepted Accounting Principles (GAAP), so one must take the vantage point of an external constituency and rely on less precise and assumption-driven customer analytic models.

2 Implementation

This paper will seek to establish which churn forecasting models best fit historical data from the U.S. wireless telecommunications industry. The reasons for choosing the wireless industry are three-fold: 1) its contractual nature makes retention rate forecasting highly

applicable; 2) the extent of regulatory disclosure provides most of the necessary unit-level information to apply probability models in marketing; and 3) customer-base analysis is more relevant from a firm valuation perspective given that the wireless space is a saturated oligopoly with high operating leverage and the biggest industry players compete primarily on customer reach and marketing expenses.

In their SEC filings, U.S. wireless telecommunications companies have historically disclosed on a quarterly basis their total customers, churn rates, and net additions—the latter two indirectly providing customer inflows and outflows—thus offering the necessary granularity to apply these methods meaningfully. However, only the postpaid subscriber follows a contractual relationship with a carrier, so we only examine these subscribers in our analysis. This forces us to disregard Leap Wireless (NASDAQ:LEAP) and MetroPCS (NYSE:PCS), which operate almost exclusively within the prepaid markets. As such, the selected companies are Sprint Nextel (NYSE:S), AT&T (NYSE:T), Verizon Communications (NYSE:VZ), T-Mobile (subsidiary of Deutsche Telekom), and U.S. Cellular (NYSE:USM).

3 Empirical Analysis

Data Collection

Most public companies in the wireless telecom industry report only net subscriber additions, with the exception of AT&T which does disclose gross subscriber additions. However, one can approximate both gross subscriber additions and deactivations through the company's churn rate. Churn across these companies is calculated by dividing net subscriber deactivations

for the quarter by the sum of the average number of subscribers for each month in the quarter.

From this churn rate it is possible to closely approximate the implied quarterly subscriber deactivations, D_t , using the formula:

$$D_t = 3 * C_t * \frac{S_t + S_{t-1}}{2}$$

where D_t are the total fiscal quarter deactivations, C_t is the fiscal quarter's monthly churn rate, and S_t and S_{t-1} are the total subscribers at the end and beginning of the fiscal quarter, respectively. A factor of 3 is used to reconcile the monthly churn rates with the length of the fiscal quarter, which spans three months. Given the publicly disclosed net subscriber additions¹ and the implied subscriber deactivations, one can calculate the implied gross subscriber additions.

There were inconsistencies in how far back these companies reported the necessary postpaid subscriber information. AT&T does not disclose the necessary quarterly postpaid subscriber information prior to 2009, yielding only 12 quarters of data. Sprint Nextel, T-Mobile, Verizon Wireless, and U.S. Cellular all disclose the necessary quarterly postpaid subscriber information as far back as Q1 2006, yielding 24 fiscal quarters of comparable data. This data is shown in **Table 1a** of the Appendix.

Data Organization

¹ The net customer additions reported does not always match the sequential quarterly change in total subscribers, and this is generally because customers gained from acquisitions or lost from divestitures are taken into account in the total subscriber count but not in the net addition count. I reconcile these gains and losses with the net subscriber additions.

Beginning in Q1 2006 (with the exception of AT&T, which begins in Q1 2009), we segment the subscriber base into multiple cohorts. We assume that the beginning postpaid subscriber count comprises a single cohort and that in each quarter gross additions comprise a new cohort, with gross subscriber additions occurring at the end of the period. However, as an external constituency we do not know how to allocate deactivations across cohorts because we lack the cohort-specific retention rates. In a setting with full information, the data structure is neatly segmented in a triangular matrix form, as seen in **Table 3.1** below. In this data structure, n_{11} is the pooled number of postpaid subscribers as of Q1 2006 (Q1 2009 in the case of AT&T), n_{xy} is the number of active subscribers within cohort x as of period y , and n_{Ty} is the total number of subscribers as of period y .

Cohort	Calendar Time →				
1	n_{11}	n_{12}	n_{13}	...	n_{1I}
2		n_{22}	n_{23}	...	n_{2I}
3			n_{33}	...	n_{3I}
⋮				⋱	⋮
I					n_{II}
	n_{T1}	n_{T2}	n_{T3}	...	n_{TI}

Table 3.1: Multi-Cohort Data Structure with Full Information

If the necessary data were available, we could apply timing models to each individual cohort. This would be preferred given the first cohort is presumably more loyal than the rest and thus will have a higher retention rate than the marginal cohort acquired each period.

Using the limited data structure models from Fader and Hardie (2007b), we can estimate the cohort-specific retention rates through an ordinary least squares (OLS) regression given the single-event timing model chosen. In our case, the limited information data structure corresponds to a scenario where we know the initial size of each cohort—the first cohort being the total postpaid subscribers in the initial data period, and each follow-on cohort being the gross postpaid subscribers acquired—and the total subscribers each period, with the generic form seen in **Table 3.2** below. As an example of this data structure as it applies to A&T, please refer to **Table 1b** of the appendix.

Cohort		Calendar Time →			
1	n_{11}	?	?	...	?
2		n_{22}	?	...	?
3			n_{33}	...	?
⋮				⋮	⋮
I					n_{II}
		n_{T1}	n_{T2}	n_{T3}	... n_{TI}

Table 3.2: Telecom Data Structure for External Constituencies

Using OLS, we can estimate the rest of the upper triangular matrix. For any new cohort n_{ii} , we estimate any subsequent period size n_{ij} as follows:

$$\widehat{n}_{ij} = n_{ii}S(j - i | \text{model parameters})$$

$$\text{for } i = 1, \dots, I - 1, \quad j = i + 1, \dots, I.$$

We then estimate n_{Tj} , the total subscribers in period j :

$$\widehat{n}_{Tj} = n_{jj} + \sum_{i=1}^{j-1} \widehat{n}_{ij}$$

$$\text{for } j = 2, \dots, I.$$

We then use an optimization technique (such as Excel's solver function) to find the model parameters that minimize the sum of squared errors (SSE):

$$\sum_{j=2}^I (n_{Tj} - \widehat{n}_{Tj})^2$$

The SSE will be the basis of comparisons across models for a given wireless provider.

4 Empirical Analysis

We consider multiple continuous-time contractual models across the five selected telecom companies. Our established framework begins with a general continuous-time model and incorporates added layers of complexity. This complexity is meant to test for the effects of different factors on service retention, including: 1) heterogeneity, 2) duration dependence, 3)

cross-cohort differences, 4) seasonality, and 5) contractual expirations. Because accounting for additional factors can only increase the fit, we will calibrate our models to half the data, extrapolate based on the OLS-derived parameters, and see how well it fits the actual data out-of-sample. As has been shown in previous studies (e.g., Neslin 2004), these churn models tend to have staying power over relatively short periods of time, so if any of the factors above do in fact contribute to subscribers' retention rates, the model should fit well out-of-sample as well.

General Form

In each of these models, the individual-level behavior is the time-to-drop, or “churn rate”, which we assume to be exponentially distributed. That is, the probability of having terminated a contractual relationship with a wireless provider at time t , given individual rate parameter λ , is:

$$F(t|\lambda) = P(T \leq t) = 1 - e^{-\lambda t}$$

Heterogeneity

Part of this model's simplicity is the assumption that the churn rate, λ , is constant across the customer base. We can account for the unobserved heterogeneity through a mixture distribution, where each subscriber's λ_i is drawn from a gamma distribution with scale parameter α and shape parameter r :

$$g(\lambda|r, \alpha) = \frac{\alpha^r \lambda^{r-1} e^{-\alpha\lambda}}{\Gamma(r)}$$

We choose the gamma function as the mixture distribution because it is both mathematically convenient and extremely flexible. The convolution of these two distributions, known as the exponential-gamma (EG) distribution, yields the probability of a subscriber surviving until time t , and its cumulative distribution function (cdf) is given by:

$$\begin{aligned} F(t|r, \alpha) &= \int_0^\infty F(t|\lambda)g(\lambda|r, \alpha)d\lambda \\ &= 1 - \left(\frac{\alpha}{\alpha + t}\right)^r \end{aligned}$$

Duration Dependence

A customer's propensity to churn may be a function of his tenure with the wireless provider, a phenomenon known as duration dependence. In contractual settings, it has been documented that a subscriber's propensity to churn generally tends to decrease with time, a concept known as negative duration dependence and characterized by a decreasing hazard function (Reichheld 1996). To this end, we loosen the exponential distribution's assumption of a constant hazard function to test for underlying time dynamics through the Weibull distribution (rate parameter λ and shape parameter c). The Weibull distribution's hazard function is:

$$h(t) = c\lambda t^{c-1}$$

which implies a cdf of:

$$F(t|\lambda, c) = 1 - \exp\left(-\int_0^t c\lambda u^{c-1} du\right)$$

$$= 1 - e^{-\lambda t^c}$$

The Weibull function is robust in that it can collapse to the exponential if $c = 1$ (implying no duration dependence), while also accounting for potential increasing ($c > 1$, implying positive duration dependence) or decreasing ($c < 1$, implying negative duration dependence) underlying churn rates as a customer's tenure increases.

In addition to testing the Weibull by itself we also incorporate heterogeneity through the Weibull-gamma (WG) distribution in order to segregate duration dependence effects from heterogeneity effects in the underlying cohort dynamics. For the WG, the convolution can be simplified in a manner similar to that of the EG distribution, yielding a cdf of:

$$F(t|r, \alpha, c) = 1 - \left(\frac{\alpha}{\alpha + t^c} \right)^r$$

Cohort-Specific Differences

As discussed above, the data available lends itself to a limited information data structure where the first cohort is the total postpaid subscribers in the initial data period and each follow-on cohort represents the gross postpaid subscribers acquired. It is possible that this first cohort is significantly more loyal (i.e. its members have lower λ 's), so that the entire customer base is characterized by two segments over time: that belonging to the original cohort of customers and that comprised of the cumulative gross additions retained by the firm. In doing so, we maintain the same survival rate functions and models above, but prescribe unique parameters to the first cohort with the exception of the α (scale) parameter, as it is relatively meaningless and conserves our number of parameters.

Covariates: Seasonality and Contract Renewal Period

It has been empirically shown that seasonality plays a role in the period-to-period retention rates, and this may also be the case across the postpaid wireless space (see Danaher 2002; Radas and Shugan 1998). For example, beyond impacting the number of gross additions across carriers, the winter holiday season may also affect retention rates if subscribers rationalize receiving a new cell phone as an opportunity to switch carriers. Incorporating seasonality is also important because our limited information data structures are organized so that retention rates across cohorts vary as a function of tenure, not as a function of calendar time. The addition of these covariates could thus proxy for calendar-time effects that would otherwise appear as noise. In our model, variables Spring (t), Summer(t), and Fall(t) aim to capture hazard function shocks tied to seasonality, leaving the winter season as the baseline. Spring(t)=1 for calendar quarters 1,5,9,etc.; Summer(t)=1 for calendar quarters 2, 6, 10, etc.; and Fall(t)=1 for calendar quarters 3,7,11,etc.. In the two-segment models, the same seasonality parameters are applied to the initial cohort as to the rest of the cohorts, the main reason being to conserve parameters.

We also test for the potential effect of contract expirations. While a subscriber can terminate his relationship with the carrier at any point, he or she may be more incented to do so after the typical two-year contract expires. We test for contract expiration effects through an additional dummy variable, Contract₁, which equals 1 in the ninth “tenure quarter”, capturing a one-time higher propensity to drop out following termination of the two-year plan. We also considered a second dummy variable, Contract₂, for which Contract₂(t) =1 from the tenth

“tenure quarter” onwards, capturing a permanently steeper drop-out curve due to an anticipated greater-than-usual propensity to terminate with the carrier. However, we steered clear of doing this because the dummy would have captured data points that were mostly out-of-sample, most likely resulting in a poor fit.

We incorporate both the calendar-time effects and tenure-length effects through the proportional hazards regression framework, as follows:

$$h[t|\theta_i, X(t), \beta] = h_0(t|\theta_i) \exp[\beta' X(t)]$$

where $X(t)$ is the vector of covariates and β is the effect of the covariates. In the case of the Weibull, this results in a cdf of the form:

$$F(t|\lambda, c, X(t), \beta) = 1 - \exp(-\lambda B(t))$$

In the case of the WG, this results in a cdf of the form:

$$F(t|\lambda, \alpha, r, c, X(t), \beta) = 1 - \left(\frac{\alpha}{\alpha + B(t)} \right)^r$$

For both,

$$B(t) = \sum_{i=1}^t [i^c - (i-1)^c] \exp(\beta' x(i))$$

where

$$\beta' x(i) = \beta_1 \text{Spring}(i) + \beta_2 \text{Summer}(i) + \beta_3 \text{Fall}(i) + \beta_4 \text{Contract}_1(i)$$

5 Method

Upon establishing the general form of the model and subsequently adding layers of complexity evaluating factors such as heterogeneity, duration dependence, cohort-specific differences, and seasonality/contractual termination, we fit 8 unique timing models across the public data of the five wireless providers. Because we gradually incorporate four potentially significant factors into our models, a total of 16 model combinations are possible; however, it is difficult to make parameter-weighted comparisons across the OLS method implemented, so we arbitrarily chose 8 models in a build-up fashion. These models are:

- 1) Exponential (E)
- 2) Weibull (W)
- 3) Exponential-Gamma (EG)
- 4) Weibull-Gamma (WG)
- 5) 2-Segment Weibull (2W)
- 6) 2-Segment Weibull-Gamma (2WG)
- 7) 2-Segment Weibull with Covariates (2W_C)
- 8) 2-Segment Weibull-Gamma with Covariates (2WG_C)

The factors that each of these models accounts for can be found in Table 5.1 below:

Model	Heterogeneity	Duration Dependence	Cohort Segmentation	Seasonality	Contract Expiration
E					
W		✓			
EG	✓				
WG	✓	✓			
2W		✓	✓		
2WG	✓	✓	✓		
2W_C		✓	✓	✓	✓
2WG_C	✓	✓	✓	✓	✓

Table 5.1: Models Implemented and their Corresponding Factors

In the case of Sprint Nextel, Verizon, T-Mobile, and U.S. Cellular we choose the quarterly data spanning 2006-2008 as the calibration period (12 fiscal quarters), allowing us to test the models' forecasting ability for the quarterly data spanning 2009-2011. In the case of AT&T, we do not bifurcate the data into calibration and forecast periods because of the small sample size.

6 Results and Discussion

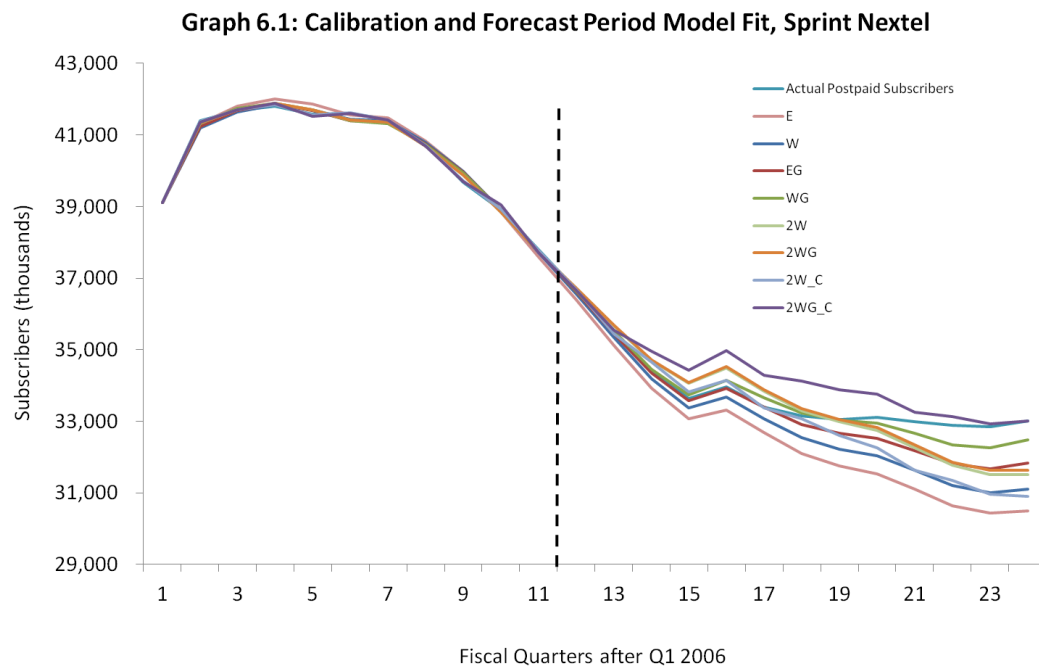
Results for Sprint Nextel

Sprint Model Parameters and Performance													
Model	λ	r	α	c	λ_{c1}	r_{c1}	c_{c1}	β_1	β_2	β_3	β_4	SSE (Train)	SSE (Test)
E	0.069	-	-	1	-	-	-	-	-	-	-	360,405	28,008,720
W	0.073	-	-	0.975	-	-	-	-	-	-	-	205,824	14,547,974
EG	-	7.3	101.4	1	-	-	-	-	-	-	-	171,115	5,361,237
WG	-	3.4	48.6	1.033	-	-	-	-	-	-	-	156,237	1,351,710
2W	0.260	-	-	0.701	0.069	-	0.789	-	-	-	-	115,699	6,926,666
2WG	-	42.3	165.9	0.716	-	11.469	0.797	-	-	-	-	117,615	6,002,197
2W_C	0.150	-	-	0.856	0.079	-	0.844	0.036	(0.150)	0.019	(62.653)	7,413	13,282,235
2WG_C	-	64.7	176.8	0.786	-	14.130	0.571	0.060	(0.151)	0.017	1.236	44,550	4,947,492

Table 6.1: Sprint Nextel Model Results

For Sprint Nextel, we see that the simpler WG significantly outperforms the rest of the models out-of-sample, although in-sample it fits the data less well than all models incorporating cross-cohort differences and seasonality/contract expiration effects. This model's r and α parameters, when compared to those of the four other wireless providers, suggest that the Sprint customer base is much less homogeneous with respect to propensity to churn. In-sample, the best fit was 2W_C, which interestingly anticipated a strong one-time drop post-contract for many of its customers, as seen through the β_4 parameter. However, this model appears to "overfit" the data, and the in-sample parameters may not be representative of the true underlying behavior of the customer base in the long-term. Despite the outperformance of W

over E and WG over EG, there does not appear to be firm-wide duration dependence, as the c parameters for W and WG oscillate too closely to 1. However, upon disaggregating the first cohort from the total postpaid subscribers, we see across the 2W, 2WG, 2W_C, and 2WG_C models a sign of significant negative duration dependence. Nevertheless, whether Sprint subscribers tend to exhibit negative duration dependence is not fully validated given these models' poor relative performance out-of-sample.



Results for Verizon

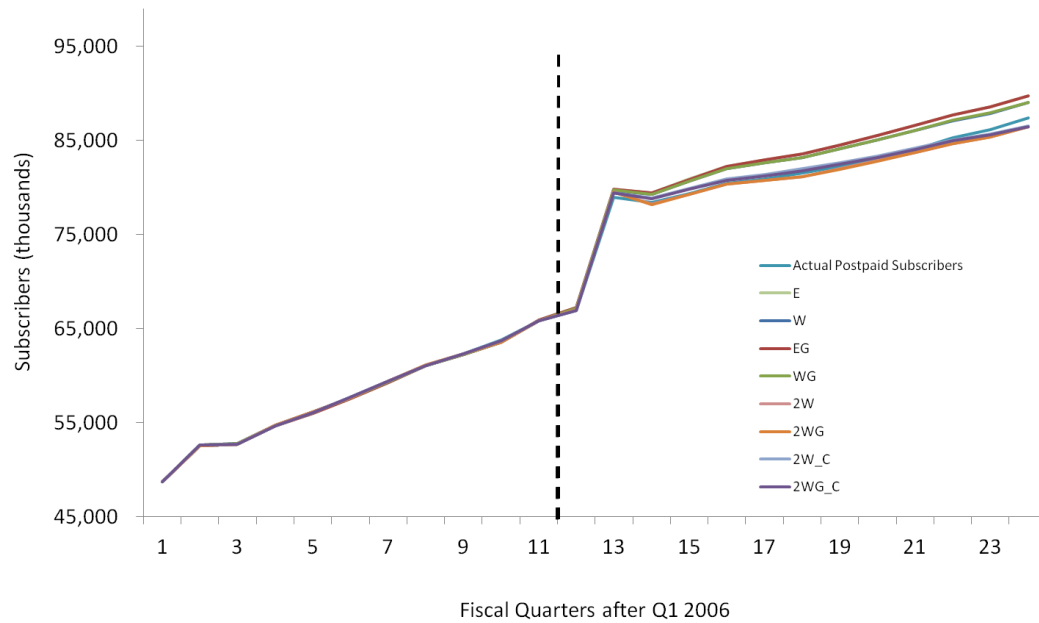
Verizon Model Parameters and Performance													
Model	λ	r	α	c	λ_{c1}	r_{c1}	c_{c1}	β_1	β_2	β_3	β_4	SSE (Train)	SSE (Test)
E	0.028	-	-	1	-	-	-	-	-	-	-	171,927	51,234,852
W	0.027	-	-	1.027	-	-	-	-	-	-	-	112,123	31,335,961
EG	-	367.6	13,003	1	-	-	-	-	-	-	-	173,519	50,933,096
WG	-	49.9	1,864.9	1.028	-	-	-	-	-	-	-	114,011	32,409,820
2W	0.106	-	-	0.689	0.028	-	0.819	-	-	-	-	61,940	2,686,746
2WG	-	38.7	358.6	0.688	-	10.057	0.817	-	-	-	-	62,018	2,815,806
2W_C	0.055	-	-	0.872	0.031	-	0.913	(0.064)	(0.128)	(0.008)	0.658	7,771	2,733,159
2WG_C	-	3.1	47.1	0.887	-	1.449	0.910	(0.066)	(0.127)	(0.012)	0.679	8,116	2,169,690

Table 6.2: Verizon Model Results

Verizon's E and W models show that these subscribers have the lowest average churn parameters (λ) in the peer set, which is corroborated by the firm's historically low relative churn rates. There is evidence of significant homogeneity in Verizon's subscriber base, as seen in the high r (shape) and α (scale) parameter values across the models; in fact, the higher SSE for the EG and WG models over the E and W models, respectively, despite the use of an additional parameter, suggests that the mixture distribution cannot capture the full extent of homogeneity in the subscriber base. Furthermore, the addition of factors such as differences and seasonality/contract termination appears to significantly improving the model both in- and out-of-sample. In these models, both the initial cohort and the segment of additional cohorts appear to exhibit significant negative duration dependence. With respect to seasonality, the negative value of the $\beta_1, \beta_2, \beta_3$ parameters (corresponding to Spring, Summer, and Fall, respectively) suggests that customers tend to churn less often in these months than during the Winter season. Perhaps the most interesting implication from these Verizon model results is in the sign of the β_4 parameter; it suggests that upon terminating a contract, customers on average appear to be more likely to stay with the firm. This may appear unintuitive, but it is certainly not unreasonable; if a firm has strong customer service, a satisfied subscriber will not only prolong his tenure with the carrier (Bolton 1998), but may also be more inclined to switch carriers *during* his contractual tenure as opposed to *after*. Another potential explanation, especially given the high penetration in the industry, is that gross additions tend to be less credit-worthy subscribers who struggle to maintain their monthly obligations, whereas those capable of paying their bills consistently for two years are likely able to renew their contract. Lastly, one could argue that the opportunity cost of switching is highest immediately after the

two-year contract, since subscribers can now tack on a new subsidized phone to a renewed contract.

Graph 6.2: Calibration and Forecast Period Model Fit, Verizon



Results for T-Mobile

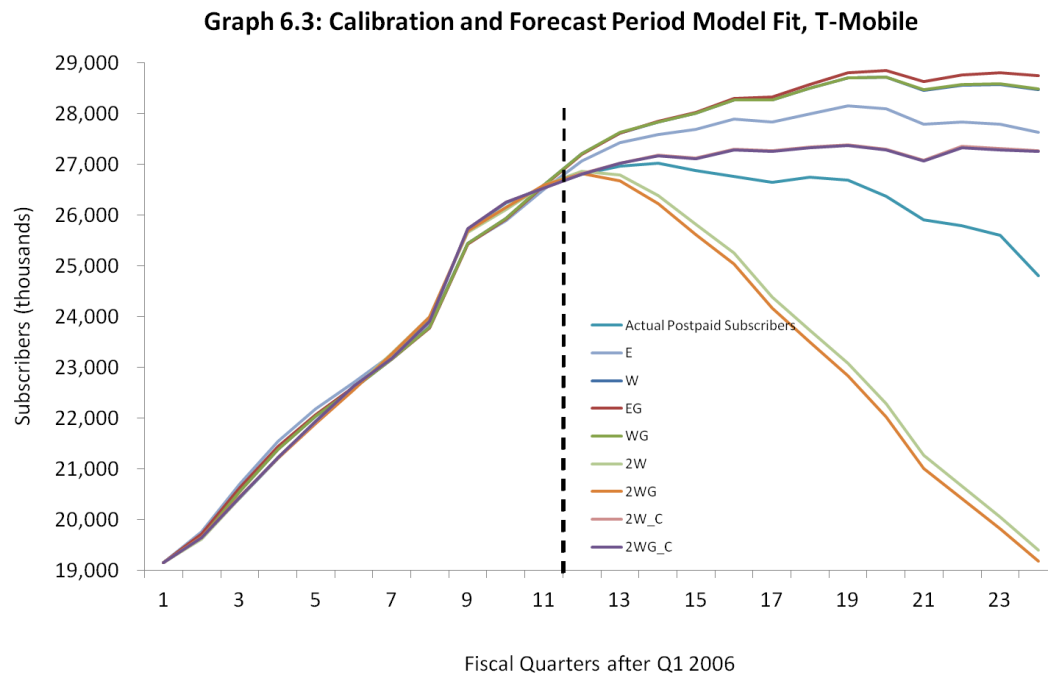
T-Mobile Model Parameters and Performance													
Model	λ	r	α	c	λ_{c1}	r_{c1}	c_{c1}	β_1	β_2	β_3	β_4	SSE (Train)	SSE (Test)
E	0.063	-	-	1	-	-	-	-	-	-	-	542,688	31,547,315
W	0.070	-	-	0.947	-	-	-	-	-	-	-	411,982	56,897,872
EG	-	4.7	71.5	1	-	-	-	-	-	-	-	478,290	64,059,270
WG	-	470.8	6746.1	0.947	-	-	-	-	-	-	-	412,490	57,072,654
2W	0.001	-	-	3.197	0.072	-	1.067	-	-	-	-	46,223	155,688,964
2WG	-	3.0	34478.6	4.116	-	2,382.4	1.103	-	-	-	-	33,175	173,723,083
2W_C	0.302	-	-	0.375	0.076	-	0.681	(0.058)	(0.086)	0.075	3.005	928	15,336,795
2WG_C	-	44.5	151.3	0.388	-	11.531	0.693	(0.057)	(0.084)	0.074	2.991	947	14,986,568

Table 6.3: T-Mobile Model Results

Analyzing the models in aggregate, those accounting for cross-cohort differences perform best in-sample; of these, those not incorporating covariates fit the data poorly out-of-sample while those incorporating covariates fit the data significantly better out-of-sample. 2W and 2WG incorrectly forecast a massive decline in the overall retention rates (see graph 6.3), attributable to a high positive duration dependence (c values of 3.2 and 4.1, respectively) in the segment of additional cohorts. Interestingly, this same segment appears to have high *negative* duration dependence (c values of 0.38 and 0.39 for 2W_C and 2WG_C, respectively) upon incorporating covariates into these models, and this results in much better in- and out-of-sample fits. The general conclusion would be that these covariates help disaggregate the effects of seasonality and contract termination from those of duration dependence, and in accounting for more of the variance the non-covariate models do not “overfit” the data through the c parameter. The negative values of the β_1 and β_2 parameters (corresponding to Spring and Summer, respectively), suggests that customers tend to churn less often in these months than during the winter season, while the opposite is true during the fall (positive β_3 parameter). As was the case with Verizon, the 2W_C and 2WG_C models suggest that customers on average have a greater propensity to extend their tenure with their carrier upon the termination of their contract. Again, it is difficult to determine the root cause of this, but potential explanations include superior customer service or subscriber credit-worthiness.

While the customer base as a whole appears to be highly homogeneous, there does appear to be some qualitative differences across the two sub-segments. The 2W_C model suggests that the segment of additional cohorts has a much higher propensity to churn ($\lambda = 0.30$) but that those subscribers who do not drop out see their tendency to churn decrease with

tenure ($c = 0.38$). This would be in line with the hypothesis above of superior customer service, or simply a superior value proposition to subscribers who are initially reluctant about the carrier. On the other hand, the more loyal initial cohort has a lower propensity to churn ($\lambda = 0.08$), and those that do not drop out also see their tendency to churn decrease, but at a lesser rate than that of the other segment ($c = 0.68$).

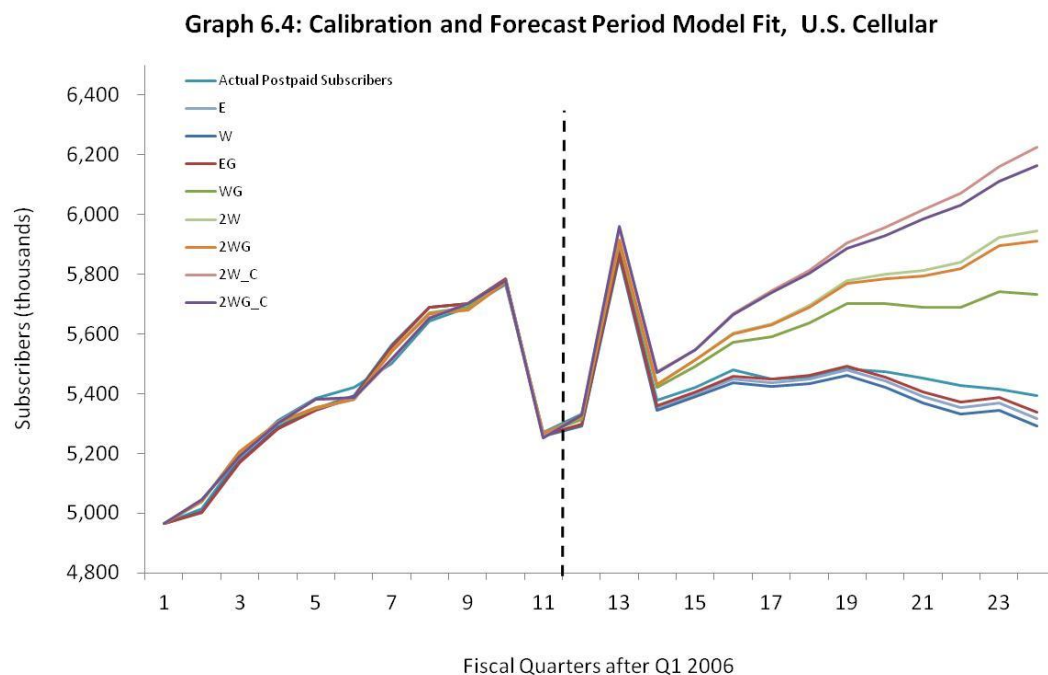


Results for U.S. Cellular

U.S. Cellular Model Parameters and Performance													
Model	λ	r	α	c	λ_{c1}	r_{c1}	c_{c1}	β_1	β_2	β_3	β_4	SSE (Train)	SSE (Test)
E	0.049	-	-	1	-	-	-	-	-	-	-	10,605	31,139
W	0.048	-	-	1.008	-	-	-	-	-	-	-	10,467	50,248
EG	-	44.2	906.2	1	-	-	-	-	-	-	-	10,594	21,047
WG	-	0.816	19.5	1.198	-	-	-	-	-	-	-	6,597	521,911
2W	0.041	-	-	0.777	0.041	-	1.145	-	-	-	-	5,731	1,178,555
2WG	-	11.3	253.8	0.795	-	10.355	1.144	-	-	-	-	5,780	1,063,984
2W_C	0.023	-	-	0.807	0.035	-	1.220	(0.069)	0.126	0.159	(16.745)	3,007	2,678,031
2WG_C	-	9.7	254.1	0.714	-	8.987	1.208	(0.086)	0.115	0.149	(3.414)	3,084	2,366,404

Table 6.4: U.S. Cellular Model Results

In the case of U.S. Cellular, the simpler models outperform those accounting for additional factors in the out-of-sample period. A cursory look at the first three models above suggests little duration dependence and a highly homogeneous subscriber base. Beyond that, it is difficult to make specific assertions about the cohort dynamics. As with any of the carriers' models, it may not necessarily be the case that the covariates do not play a meaningful role, or that the propensity to churn does not differ across the two segments; instead what is more likely is that the parameters “overfit” the data given the small calibration period (only 12 periods).



Results for AT&T

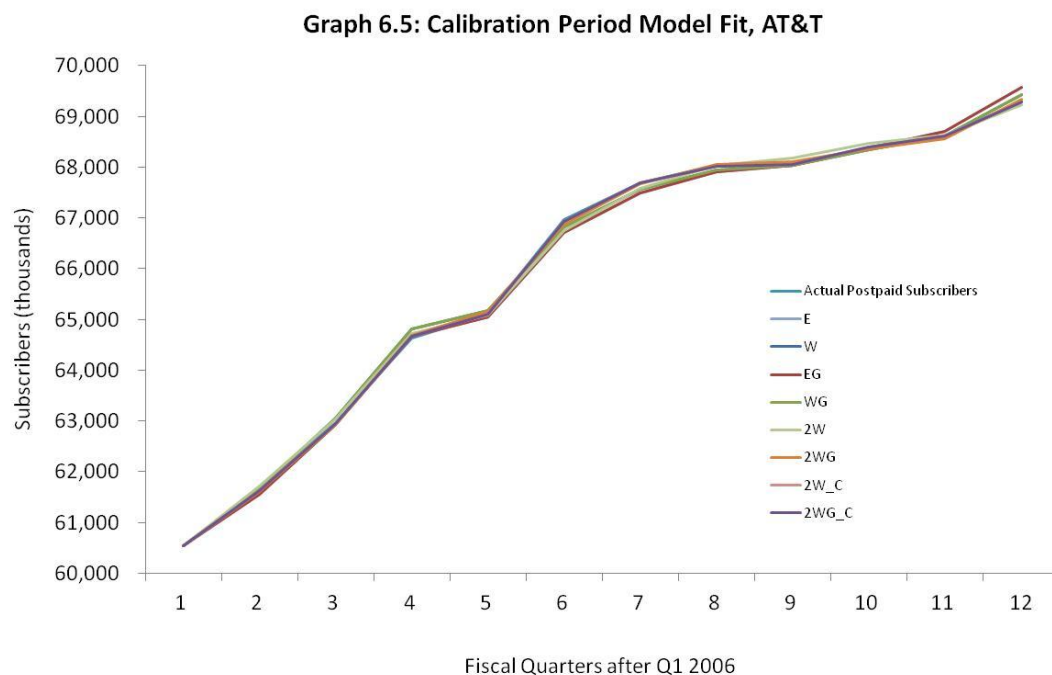
AT&T Model Parameters and Performance												
Model	λ	r	α	c	λ_{c1}	r_{c1}	c_{c1}	β_1	β_2	β_3	β_4	SSE (Train)
E	0.034	-	-	1	-	-	-	-	-	-	-	218,595
W	0.033	-	-	1.025	-	-	-	-	-	-	-	108,588
EG	-	519.8	15,127	1	-	-	-	-	-	-	-	220,728
WG	-	316.2	9,673.2	1.025	-	-	-	-	-	-	-	109,143
2W	0.000	-	-	3.197	0.032	-	1.115	-	-	-	-	115,924
2WG	-	0.0	41,798	7.932	-	1,400	1.071	-	-	-	-	22,722
2W_C	0.010	-	-	1.631	0.036	-	1.008	(0.022)	(0.091)	(0.016)	(4.964)	7,524
2WG_C	-	4.7	423.0	1.631	-	15.480	1.006	(0.024)	(0.093)	(0.017)	(4.817)	7,081

Table 6.5: AT&T Model Results

Given the data constraints for A&T, having both a calibration and forecast period seemed inadequate. For this reason, we fit each of the models to all of the available data, and as expected—given they have more parameters and can only improve the SSE—the more complex models fit the data much better. If we assume the parameters are indicative of the customer base’s actual churn distribution, the two-segment subscriber base appears relatively homogeneous with negative duration dependence in the segment of additional cohorts and no duration dependence in the first cohort. Customers tend to churn at lower rates than other carriers, excluding Verizon. Under these parameters, subscribers appear less likely to remain with the firm after the termination of their contract, and these subscribers have a higher tendency to remain with the firm during the Spring, Summer, and Fall. However, it could be the case, as seen with U.S. Cellular, that the additional parameters “overfit” the data and have no real meaning.

That being said, we projected the survival rate function out to another 12 fiscal quarters to shed some light on what each of these models said about the underlying subscriber behavior.

The survival rates declined at about a similar rate for all models, although 2W and 2W_G were relatively more pessimistic than the rest. This graph, as well as the survival functions for all the other carriers, can be found in the Appendix (**Graph 1-5**).



7 Conclusions

General Findings

Although the time series data for the carriers, especially AT&T, lacked sufficient data points to make any conclusive remarks regarding the underlying consumer behavior, consistency across some of the models does allow an external constituency to hypothesize on general characteristics of certain carriers' customer bases. Verizon and T-Mobile appeared to have the best out-of-sample fits when incorporating a multitude of factors. In the case of Verizon Wireless, we see a very homogeneous customer base with a relatively low churn

parameter, negative duration dependence, and a higher likelihood to churn during the winter and during its contract period (as opposed to immediately after). T-Mobile's subscribers bear many of the same general characteristics to those of Verizon, with the exception of a much higher churn parameter and a staggeringly greater negative duration dependence. We explored potential reasons for this behavior but things remain inconclusive as an external constituency.

In examining our model results, it is important to be mindful of potentially having “overfit” and consequently “overdescribed” the data, especially in the case of the 2WG_C model, which had 11 parameters. Covariates may have inadvertently captured what happened to be mere noise. The low levels of disclosure regarding subscribers prior to 2006 only provided us with 24 fiscal quarters on which to compare wireless carriers, exacerbating the potential risk of “overfitting”. Furthermore, our reliance on the limited information data structures proposed by Fader and Hardie (2007) forced us to extend the same tenure-driven churn propensities to all cohorts unless we integrated additional parameters. However, our model development should provide a general framework through which to apply these methods to contractual settings as more data becomes available.

Shortcomings and Potential Improvements

The data limitations severely impeded the depth of analysis. Because the calibration period was only 12 periods, we were reluctant to incorporate more parameters for fear of “overfitting” the data. Additional parameters with potentially robust predictive power include: 1) a unique set of covariate parameters for each of the two segments, 2) a second covariate related to contract termination (capturing a permanent change in the underlying propensity to

churn), 3) a set of covariates related to promotional effects, which have been shown to affect churn rates in a contractual setting (Lewis 2004), or 4) potential cross-cohort effects, as discussed in Bradlow, Fader, and Schweidel (2008).

The poor out-of-sample fits for both U.S. Cellular and Sprint could also be due to incorrect assumptions regarding unit-level economics and a disregard for the competitive environment. For example, today's traditional two-year plan may not have been the norm throughout the entirety of the data analysis horizon, rendering the carefully-placed β_4 parameter irrelevant. Furthermore, we ignored the likely *cross-carrier* effects in our models, which indirectly assume that a subscriber's decision at any point in time is binomial (stay with carrier or drop out), when in fact it is a more complex multinomial decision given the myriad carriers available. Ultimately, a closer analysis of the competitive landscape would have been helpful throughout this process.

Further, a lot of our hypotheses could have been directly confirmed had we been an internal constituency. For instance, we hypothesized based on the parameter estimates that Verizon subscribers are generally very happy with their service; they have the lowest overall churn rate parameter, their subscribers appear eager and willing to renew their contract, and both existing and new cohorts exhibit negative duration dependence. However, none of this can be asserted conclusively. These methods are powerful in that we can look beyond reported gross additions and deactivations figures and quantitatively understand a carrier's value proposition and competitive advantages, but until confirmed by someone with subscriber-level data it remains a mere curve-fitting exercise.

Appendix

Table 1a. Postpaid Operating Data across Wireless Carriers

		2011				2010				2009				2008				2007				2006			
		4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q
Sprint	Wireless Subscribers	33,014	32,853	32,897	32,998	33,112	33,054	33,161	33,389	33,967	33,636	34,437	35,428	36,678	37,783	38,905	39,681	40,751	41,434	41,601	41,585	41,805	41,675	41,405	39,103
	Net Wireless Additions	161	(44)	(101)	(114)	58	(107)	(228)	(578)	331	(801)	(991)	(1,250)	(1,105)	(1,122)	(776)	(1,070)	(683)	(167)	16	(220)	130	270	2,302	2,126
	Postpaid Churn Rate (%)	1.98	1.91	1.75	1.81	1.86	1.93	1.85	2.15	2.11	2.17	2.05	2.25	2.16	2.15	1.98	2.45	2.29	2.3	2	2.3	2.3	2.4	2.1	2.1
	Implied Gross Wireless Additions	2,117	1,840	1,629	1,681	1,904	1,810	1,619	1,594	2,471	1,415	1,157	1,184	1,308	1,351	1,558	1,886	2,140	2,698	2,512	2,657	3,010	3,261	4,838	4,523
	Implied Wireless Deactivations	1,956	1,884	1,730	1,795	1,846	1,917	1,847	2,172	2,140	2,216	2,148	2,434	2,413	2,473	2,334	2,956	2,823	2,865	2,496	2,877	2,880	2,991	2,536	2,397
	Quarterly Retention Postpaid Rate (BG)	94.4%	94.6%	95.0%	94.8%	94.7%	94.5%	94.7%	93.9%	94.1%	93.8%	94.1%	93.6%	93.8%	93.9%	94.3%	93.1%	93.5%	93.5%	94.3%	93.5%	93.6%	93.3%	94.2%	94.2%
		Quarterly Retention Postpaid Rate (sBG)	94.0%	94.3%	94.8%	94.6%	94.4%	94.2%	94.5%	93.6%	93.6%	93.9%	93.4%	93.6%	93.6%	94.1%	92.7%	93.2%	93.1%	94.0%	93.1%	93.1%	92.8%	93.5%	93.5%
Verizon	Wireless Subscribers	87,382	86,175	85,290	84,031	83,125	82,257	81,573	80,912	80,495	79,371	78,395	78,934	66,940	65,850	63,800	62,300	61,101	59,400	57,700	56,100	54,682	52,731	52,600	48,760
	Net Wireless Additions	1,207	885	1,259	906	868	684	661	417	1,124	976	(539)	11,994	1,090	2,050	1,500	1,199	1,701	1,700	1,600	1,418	1,951	131	3,840	1,500
	Postpaid Churn Rate (%)	0.94	0.94	0.89	1.01	1.01	1.07	0.93	1.05	1.05	1.12	1.01	1.14	1.05	1.03	0.83	0.93	0.94	0.96	0.85	0.89	0.90	0.95	0.87	0.92
	Implied Gross Wireless Additions	3,654	3,303	3,519	3,438	3,374	3,313	2,928	2,959	3,642	3,626	1,845	14,488	3,181	4,053	3,070	2,920	3,400	3,386	3,051	2,897	3,401	1,632	5,163	2,825
	Implied Wireless Deactivations	2,447	2,418	2,260	2,532	2,506	2,629	2,267	2,542	2,518	2,650	2,384	2,494	2,091	2,003	1,570	1,721	1,699	1,686	1,451	1,479	1,450	1,501	1,323	1,325
	Quarterly Retention Postpaid Rate (BG)	97.3%	97.3%	97.4%	97.1%	97.1%	96.9%	97.3%	97.0%	97.0%	96.8%	97.0%	96.9%	97.0%	97.0%	97.6%	97.3%	97.3%	97.2%	97.5%	97.4%	97.4%	97.2%	97.5%	97.4%
		Quarterly Retention Postpaid Rate (sBG)	97.2%	97.2%	97.3%	97.0%	97.0%	96.8%	97.2%	96.8%	96.6%	97.0%	96.3%	96.8%	96.9%	97.5%	97.2%	97.1%	97.1%	97.4%	97.3%	97.3%	97.1%	97.3%	97.2%
A&T	Wireless Subscribers	69,309	68,614	68,353	68,062	68,041	67,688	66,970	65,108	64,627	62,961	61,647	60,535	N/A				N/A				N/A			
	Net Wireless Additions	695	261	291	21	353	718	1,862	481	1,666	1,314	1,112	60,535												
	Postpaid Churn Rate (%)	1.21	1.15	1.15	1.18	1.15	1.14	1.01	1.07	1.15	1.14	1.07	1.15												
	Implied Gross Wireless Additions	3,198	2,624	2,644	2,430	2,694	3,021	3,863	2,563	3,867	3,445	3,073	62,623												
	Implied Wireless Deactivations	2,503	2,363	2,353	2,409	2,341	2,303	2,001	2,082	2,201	2,131	1,961	2,088												
	Quarterly Retention Postpaid Rate (BG)	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%												
		Quarterly Retention Postpaid Rate (sBG)	96%	97%	97%	96%	97%	97%	97%	97%	97%	97%	N/A												
T-Mobile	Wireless Subscribers	24,797	25,598	25,784	25,904	26,375	26,692	26,752	26,646	26,765	26,882	27,022	26,966	26,806	26,539	26,246	25,721	23,914	23,181	22,624	21,937	21,211	20,428	19,656	19,149
	Net Wireless Additions	(801)	(186)	(120)	(471)	(317)	(60)	106	(119)	(117)	(140)	56	160	267	293	525	1,807	733	557	687	726	783	772	507	725
	Postpaid Churn Rate (%)	3.10	2.40	2.40	2.40	2.50	2.40	2.20	2.20	2.50	2.40	2.20	2.30	2.40	2.40	1.90	1.70	1.80	2.00	1.80	1.90	2.10	2.30	2.20	2.10
	Implied Gross Wireless Additions	1,542	1,664	1,741	1,411	1,673	1,864	1,868	1,644	1,895	1,801	1,838	2,015	2,187	2,193	2,006	3,073	2,005	1,931	1,890	1,956	2,095	2,155	1,788	1,909
	Implied Wireless Deactivations	2,343	1,850	1,861	1,882	1,990	1,924	1,762	1,763	2,012	1,941	1,782	1,855	1,920	1,900	1,481	1,266	1,272	1,374	1,203	1,230	1,312	1,383	1,281	1,184
	Quarterly Retention Postpaid Rate (BG)	91.4%	93.3%	93.3%	93.2%	93.0%	93.3%	93.8%	93.8%	93.0%	93.3%	93.8%	93.6%	93.3%	93.3%	94.7%	95.3%	95.0%	94.4%	95.0%	94.7%	94.2%	93.7%	93.9%	94.2%
		Quarterly Retention Postpaid Rate (sBG)	90.8%	92.8%	92.8%	92.9%	92.5%	92.8%	93.4%	92.5%	92.8%	93.4%	93.1%	92.8%	92.8%	94.2%	94.7%	94.5%	93.9%	94.5%	94.2%	93.6%	93.0%	93.3%	93.6%
U.S. Cellular	Wireless Subscribers	5,608	5,322	5,356	5,394	5,416	5,426	5,451	5,473	5,482	5,456	5,448	5,480	5,420	5,379	5,884	5,331	5,269	5,766	5,688	5,644	5,502	5,420	5,384	5,311
	Net Wireless Additions	(41)	(145)	(70)	(31)	(21)	(38)	7	24	39	(6)	(59)	63	33	(3)	16	85	44	57	37	152	86	25,000	48	151
	Postpaid Churn Rate (%)	1.60	1.40	1.40	1.40	1.70	1.50	1.40	1.40	1.60	1.60	1.70	1.50	1.60	1.60	1.60	1.40	1.50	1.60	1.40	1.50	2.10	1.60	1.50	1.50
	Implied Gross Wireless Additions	548	190	188	205	266	220	207	221	289	270	247	305	300	(235)	822	285	(249)	353	282	393	426	295	314	359
	Implied Wireless Deactivations	262	224	226	227	276	245	229	230	263	262	279	245	259	270	269	223	248	275	238	251	344	259	241	236
	Quarterly Retention Postpaid Rate (BG)	95.5%	96.0%	96.0%	96.0%	95.1%	95.7%	96.0%	96.0%	95.4%	95.4%	95.1%	95.7%	95.4%	95.2%	95.6%	96.0%	95.5%	95.4%	96.0%	95.7%	94.1%	95.4%	95.7%	95.7%
		Quarterly Retention Postpaid Rate (sBG)	95.1%	95.8%	95.8%	95.8%	94.9%	95.5%	95.8%	95.2%	95.2%	94.9%	95.5%	95.2%	95.4%	95.0%	95.8%	95.7%	95.2%	95.8%	95.4%	93.7%	95.2%	95.5%	95.4%

Table 1b. Postpaid Operating Data across Wireless Carriers

	2009				2010				2011			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Cohort #1	60,535											
Cohort #2		3,073										
Cohort #3			3,445									
Cohort #4				3,867								
Cohort #5					2,563							
Cohort #6						3,863						
Cohort #7							3,021					
Cohort #8								2,694				
Cohort #9									2,430			
Cohort #10										2,644		
Cohort #11											2,624	
Cohort #12												3,198
Total Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309

Table 2a: Sprint Nextel's Exponential (E) Subscriber Data Structure

	2006				2007				2008				2009				2010				2011			
SPRINT NEXTEL	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,481	34,034	31,751	29,622	27,635	25,782	24,053	22,440	20,935	19,531	18,221	16,999	15,859	14,795	13,803	12,877	12,014	11,208	10,456	9,755	9,101	8,490	7,921
Cohort #2		4,838	4,514	4,211	3,928	3,655	3,419	3,190	2,976	2,776	2,590	2,416	2,254	2,103	1,962	1,831	1,708	1,593	1,486	1,387	1,294	1,207	1,126	1,050
Cohort #3			3,261	3,042	2,838	2,648	2,470	2,305	2,150	2,006	1,871	1,746	1,629	1,519	1,418	1,322	1,234	1,151	1,074	1,002	935	872	813	759
Cohort #4				3,010	2,808	2,620	2,444	2,280	2,127	1,985	1,852	1,727	1,612	1,503	1,403	1,309	1,221	1,139	1,063	991	925	863	805	751
Cohort #5					2,657	2,479	2,313	2,157	2,013	1,878	1,752	1,634	1,525	1,422	1,327	1,238	1,155	1,078	1,005	938	875	816	762	710
Cohort #6						2,512	2,343	2,186	2,039	1,903	1,775	1,656	1,545	1,441	1,345	1,254	1,170	1,092	1,019	950	887	827	772	720
Cohort #7							2,698	2,517	2,348	2,191	2,044	1,907	1,779	1,659	1,548	1,444	1,347	1,257	1,173	1,094	1,021	952	888	829
Cohort #8								2,140	1,997	1,863	1,738	1,621	1,512	1,411	1,316	1,226	1,146	1,069	997	930	868	810	755	705
Cohort #9									1,886	1,759	1,641	1,531	1,429	1,333	1,243	1,160	1,082	1,010	942	879	820	765	714	666
Cohort #10										1,558	1,454	1,356	1,265	1,180	1,101	1,027	958	894	834	778	726	677	632	589
Cohort #11											1,351	1,261	1,176	1,097	1,024	955	891	831	775	723	675	630	587	548
Cohort #12												1,308	1,220	1,138	1,062	991	924	862	804	750	700	653	609	568
Cohort #13													1,184	1,104	1,030	961	897	836	780	728	679	634	591	552
Cohort #14														1,157	1,080	1,007	940	877	818	763	712	664	620	578
Cohort #15															1,415	1,320	1,231	1,149	1,072	1,000	933	870	812	757
Cohort #16																2,471	2,305	2,150	2,006	1,872	1,746	1,629	1,520	1,418
Cohort #17																	1,594	1,487	1,388	1,295	1,208	1,127	1,051	981
Cohort #18																		1,619	1,510	1,409	1,314	1,226	1,144	1,067
Cohort #19																			1,810	1,689	1,575	1,470	1,371	1,279
Cohort #20																				1,904	1,776	1,657	1,546	1,442
Cohort #21																					1,681	1,568	1,463	1,365
Cohort #22																						1,629	1,520	1,418
Cohort #23																							1,840	1,716
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,319	41,808	42,014	41,854	41,558	41,469	40,828	39,975	38,852	37,598	36,384	35,127	33,929	33,068	33,321	32,681	32,108	31,764	31,538	31,104	30,646	30,431	30,507

Table 2b: Sprint Nextel's Weibull (W) Subscriber Data Structure

W	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
SPRINT NEXTEL																								
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,357	33,989	31,618	29,713	27,962	25,798	24,061	22,905	21,063	19,109	18,380	17,297	16,088	15,052	14,084	13,180	12,333	11,748	10,908	10,126	9,743	9,870	9,303
Cohort #2		4,838	4,498	4,193	3,912	3,651	3,410	3,186	2,977	2,782	2,601	2,432	2,275	2,128	1,990	1,862	1,743	1,631	1,526	1,429	1,337	1,252	1,172	1,097
Cohort #3			3,261	3,032	2,826	2,637	2,461	2,298	2,147	2,006	1,875	1,753	1,639	1,533	1,434	1,342	1,255	1,174	1,099	1,029	963	901	844	790
Cohort #4				3,010	2,799	2,609	2,434	2,272	2,122	1,982	1,852	1,731	1,618	1,513	1,415	1,324	1,238	1,159	1,084	1,015	950	889	832	779
Cohort #5					2,657	2,470	2,303	2,148	2,005	1,873	1,750	1,635	1,528	1,429	1,336	1,249	1,169	1,093	1,023	957	896	838	785	734
Cohort #6						2,512	2,335	2,177	2,031	1,896	1,770	1,654	1,545	1,444	1,350	1,263	1,181	1,105	1,033	967	905	847	792	742
Cohort #7							2,698	2,511	2,338	2,181	2,036	1,901	1,776	1,660	1,552	1,450	1,356	1,268	1,186	1,110	1,038	972	909	851
Cohort #8								2,140	1,990	1,855	1,730	1,615	1,508	1,409	1,317	1,231	1,151	1,076	1,006	941	880	824	771	721
Cohort #9									1,886	1,753	1,634	1,525	1,423	1,329	1,242	1,160	1,085	1,014	948	887	829	776	726	679
Cohort #10										1,558	1,449	1,350	1,260	1,176	1,098	1,026	959	896	838	783	733	685	641	600
Cohort #11											1,351	1,256	1,171	1,092	1,020	952	890	831	777	727	679	635	594	556
Cohort #12												1,308	1,216	1,133	1,057	987	922	861	805	752	703	657	615	575
Cohort #13													1,184	1,100	1,026	957	893	834	779	728	681	636	595	557
Cohort #14														1,157	1,076	1,003	936	874	816	762	712	666	622	582
Cohort #15															1,415	1,315	1,226	1,144	1,068	997	932	871	814	761
Cohort #16																2,471	2,297	2,141	1,998	1,865	1,741	1,627	1,520	1,421
Cohort #17																	1,594	1,482	1,382	1,289	1,203	1,124	1,050	981
Cohort #18																		1,619	1,505	1,403	1,309	1,222	1,141	1,066
Cohort #19																			1,810	1,683	1,569	1,463	1,366	1,276
Cohort #20																				1,904	1,770	1,650	1,539	1,437
Cohort #21																				1,681	1,563	1,457	1,359	
Cohort #22																				1,629	1,514	1,412		
Cohort #23																					1,840	1,711		
Cohort #24																							2,117	
Total Expected Subscribers	39,103	41,195	41,648	41,851	41,706	41,440	41,389	40,790	39,985	38,911	37,709	36,547	35,341	34,193	33,380	33,677	33,074	32,538	32,229	32,034	31,629	31,199	31,009	31,108

Table 2c: Sprint Nextel's Exponential-Gamma (EG) Subscriber Data Structure

EG	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
SPRINT NEXTEL																								
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,402	33,911	31,612	29,489	27,527	25,711	24,031	22,474	21,031	19,692	18,450	17,295	16,223	15,225	14,296	13,431	12,626	11,874	11,174	10,520	9,909	9,338	8,804
Cohort #2		4,838	4,504	4,196	3,911	3,649	3,406	3,181	2,973	2,781	2,602	2,436	2,283	2,140	2,007	1,884	1,769	1,662	1,562	1,469	1,382	1,302	1,226	1,155
Cohort #3			3,261	3,036	2,828	2,636	2,459	2,295	2,144	2,004	1,874	1,754	1,642	1,539	1,442	1,353	1,270	1,192	1,120	1,053	990	932	877	826
Cohort #4				3,010	2,802	2,610	2,433	2,270	2,119	1,979	1,850	1,730	1,619	1,516	1,420	1,331	1,249	1,172	1,100	1,034	972	914	860	810
Cohort #5					2,657	2,473	2,304	2,148	2,004	1,870	1,747	1,633	1,527	1,429	1,338	1,254	1,175	1,102	1,034	971	913	858	807	759
Cohort #6						2,512	2,338	2,178	2,030	1,894	1,768	1,651	1,543	1,443	1,351	1,265	1,185	1,111	1,042	978	918	863	811	763
Cohort #7							2,698	2,511	2,340	2,181	2,034	1,899	1,774	1,658	1,550	1,451	1,359	1,273	1,193	1,119	1,050	986	927	871
Cohort #8								2,140	1,992	1,856	1,730	1,614	1,506	1,407	1,315	1,230	1,151	1,078	1,010	947	888	833	782	735
Cohort #9									1,886	1,756	1,635	1,525	1,422	1,328	1,240	1,159	1,084	1,014	950	890	834	782	734	689
Cohort #10										1,558	1,450	1,351	1,260	1,175	1,097	1,024	957	895	838	785	735	689	646	607
Cohort #11											1,351	1,258	1,172	1,092	1,019	951	888	830	777	727	680	638	598	561
Cohort #12												1,308	1,217	1,134	1,057	986	920	860	804	751	703	658	617	578
Cohort #13													1,184	1,102	1,026	957	893	833	778	727	680	637	596	558
Cohort #14														1,157	1,077	1,004	936	873	815	761	711	665	622	583
Cohort #15															1,415	1,317	1,227	1,144	1,067	996	930	869	813	761
Cohort #16																2,471	2,300	2,143	1,997	1,863	1,739	1,624	1,518	1,420
Cohort #17																	1,594	1,484	1,383	1,289	1,202	1,122	1,048	980
Cohort #18																		1,619	1,507	1,404	1,309	1,221	1,140	1,064
Cohort #19																			1,810	1,685	1,570	1,463	1,365	1,274
Cohort #20																				1,904	1,773	1,651	1,539	1,436
Cohort #21																				1,681	1,565	1,458	1,359	
Cohort #22																				1,629	1,516	1,412		
Cohort #23																					1,840	1,713		
Cohort #24																							2,117	
Total Expected Subscribers	39,103	41,240	41,676	41,854	41,687	41,407	41,349	40,755	39,962	38,909	37,735	36,608	35,444	34,342	33,580	33,932	33,388	32,910	32,661	32,526	32,181	31,810	31,679	31,836

Table 2d: Sprint Nextel's Weibull-Gamma (WG) Subscriber Data Structure

WG	2006				2007				2008				2009				2010				2011			
SPRINT NEXTEL	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,474	33,963	31,632	29,481	27,500	25,675	23,996	22,448	21,022	19,706	18,491	17,367	16,328	15,365	14,472	13,644	12,874	12,158	11,492	10,871	10,292	9,751	9,246
Cohort #2		4,838	4,513	4,202	3,914	3,648	3,402	3,177	2,969	2,777	2,601	2,438	2,288	2,149	2,020	1,901	1,791	1,688	1,593	1,504	1,422	1,345	1,273	1,206
Cohort #3			3,261	3,042	2,832	2,638	2,459	2,293	2,141	2,001	1,872	1,753	1,643	1,542	1,448	1,362	1,281	1,207	1,138	1,074	1,014	958	907	858
Cohort #4					2,808	2,614	2,435	2,269	2,117	1,976	1,847	1,728	1,618	1,517	1,423	1,337	1,257	1,183	1,114	1,050	991	936	885	837
Cohort #5				3,010	2,657	2,478	2,308	2,149	2,003	1,869	1,745	1,630	1,525	1,428	1,339	1,256	1,180	1,109	1,044	983	927	875	826	781
Cohort #6						2,512	2,343	2,181	2,032	1,894	1,766	1,649	1,541	1,442	1,350	1,266	1,188	1,115	1,049	987	930	876	827	781
Cohort #7							2,698	2,516	2,343	2,182	2,034	1,897	1,771	1,655	1,549	1,450	1,360	1,276	1,198	1,126	1,060	998	941	888
Cohort #8								2,140	1,996	1,859	1,731	1,613	1,505	1,405	1,313	1,229	1,151	1,078	1,012	950	894	841	792	747
Cohort #9									1,886	1,759	1,638	1,526	1,422	1,326	1,238	1,157	1,083	1,014	950	892	838	787	741	698
Cohort #10										1,558	1,453	1,353	1,260	1,175	1,096	1,023	956	894	838	785	737	692	651	612
Cohort #11											1,351	1,260	1,174	1,093	1,019	950	887	829	776	726	681	639	600	564
Cohort #12												1,308	1,220	1,136	1,058	986	920	859	802	751	703	659	618	581
Cohort #13													1,184	1,104	1,028	957	892	832	777	726	679	636	596	560
Cohort #14														1,157	1,080	1,005	936	873	814	760	710	664	622	583
Cohort #15															1,415	1,320	1,229	1,144	1,067	995	929	868	812	761
Cohort #16																2,471	2,305	2,146	1,999	1,863	1,738	1,622	1,516	1,418
Cohort #17																	1,594	1,487	1,385	1,290	1,202	1,121	1,047	978
Cohort #18																		1,619	1,510	1,406	1,309	1,220	1,138	1,063
Cohort #19																				1,688	1,572	1,464	1,365	1,273
Cohort #20																				1,904	1,776	1,654	1,540	1,436
Cohort #21																					1,681	1,568	1,460	1,360
Cohort #22																						1,629	1,519	1,415
Cohort #23																							1,840	1,716
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,312	41,737	41,886	41,692	41,390	41,320	40,722	39,935	38,897	37,744	36,647	35,518	34,457	33,741	34,142	33,652	33,228	33,033	32,953	32,663	32,346	32,268	32,478

Table 2e: Sprint Nextel's 2-Segment Weibull (2W) Subscriber Data Structure

2W	2006				2007				2008				2009				2010				2011			
SPRINT NEXTEL	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,503	34,719	33,195	31,838	30,602	29,463	28,403	27,411	26,479	25,598	24,765	23,973	23,220	22,503	21,817	21,162	20,535	19,933	19,356	18,802	18,269	17,756	17,263
Cohort #2		4,838	3,729	3,169	2,757	2,432	2,164	1,939	1,747	1,581	1,436	1,308	1,195	1,095	1,005	924	851	786	726	672	622	577	536	499
Cohort #3			3,261	2,513	2,136	1,858	1,639	1,459	1,307	1,178	1,066	968	882	806	738	677	623	574	529	489	453	420	389	361
Cohort #4				3,010	2,320	1,971	1,715	1,513	1,347	1,207	1,087	984	893	814	744	681	625	575	530	489	452	418	387	359
Cohort #5					2,657	2,048	1,740	1,514	1,335	1,189	1,065	960	868	789	719	656	601	552	507	468	431	399	369	342
Cohort #6						2,512	1,936	1,645	1,431	1,262	1,124	1,007	907	821	746	679	621	568	522	480	442	408	377	349
Cohort #7							2,079	1,767	1,537	1,356	1,207	1,081	974	882	801	730	667	610	560	515	475	438	405	377
Cohort #8							2,698	2,140	1,650	1,402	1,220	1,076	957	858	773	699	635	579	529	484	444	409	377	347
Cohort #9									1,886	1,454	1,235	1,075	948	844	756	681	616	560	510	466	427	392	360	332
Cohort #10										1,558	1,201	1,020	888	783	697	625	563	509	462	421	385	353	324	298
Cohort #11											1,351	1,041	885	770	679	604	542	488	442	401	365	334	306	281
Cohort #12												1,308	1,008	856	745	657	585	524	472	427	388	354	323	296
Cohort #13													1,184	912	775	674	595	529	474	427	387	351	320	292
Cohort #14														1,157	892	758	660	582	518	464	418	378	344	313
Cohort #15															1,415	1,090	927	806	711	633	567	511	462	420
Cohort #16																2,471	1,904	1,618	1,408	1,242	1,105	990	892	807
Cohort #17																	1,594	1,229	1,044	909	801	713	639	576
Cohort #18																		1,619	1,248	1,060	922	814	724	649
Cohort #19																			1,810	1,395	1,185	1,031	910	810
Cohort #20																				1,904	1,468	1,247	1,085	957
Cohort #21																					1,681	1,296	1,101	958
Cohort #22																						1,629	1,255	1,067
Cohort #23																							1,840	1,418
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,341	41,708	41,888	41,708	41,423	41,355	40,692	39,881	38,846	37,738	36,718	35,670	34,699	34,067	34,497	33,833	33,299	32,986	32,747	32,262	31,766	31,514	31,515

Table 2f: Sprint Nextel’s 2-Segment Weibull-Gamma (2WG) Subscriber Data Structure

2WG	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
SPRINT NEXTEL																								
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,499	34,699	33,164	31,797	30,556	29,413	28,353	27,363	26,434	25,558	24,731	23,947	23,203	22,495	21,820	21,175	20,559	19,969	19,404	18,862	18,342	17,842	17,361
Cohort #2		4,838	3,751	3,188	2,772	2,443	2,173	1,945	1,751	1,583	1,437	1,309	1,195	1,094	1,004	923	850	784	724	670	621	576	535	498
Cohort #3			3,261	2,528	2,149	1,868	1,647	1,464	1,311	1,180	1,067	969	882	805	737	676	622	573	528	488	452	419	388	361
Cohort #4				3,010	2,334	1,983	1,725	1,520	1,352	1,210	1,089	985	894	814	743	681	624	574	529	488	451	417	387	359
Cohort #5					2,657	2,060	1,751	1,522	1,342	1,193	1,068	962	870	789	719	656	601	551	507	467	431	398	368	341
Cohort #6						2,512	1,947	1,655	1,439	1,268	1,128	1,010	909	822	746	679	620	568	521	479	441	407	376	348
Cohort #7							2,092	2,698	2,092	1,778	1,546	1,362	1,211	1,085	976	883	801	730	666	610	560	514	474	437
Cohort #8								2,140	1,659	1,410	1,226	1,081	961	860	775	700	636	579	529	484	444	408	376	347
Cohort #9									1,886	1,462	1,243	1,081	952	847	758	683	617	560	510	466	426	391	360	331
Cohort #10										1,558	1,208	1,027	893	787	700	626	564	510	463	421	385	352	323	297
Cohort #11											1,351	1,048	890	774	682	607	543	489	442	401	365	334	305	280
Cohort #12												1,308	1,014	862	749	660	587	526	473	428	388	354	323	296
Cohort #13													1,184	918	780	678	598	531	476	428	387	352	320	292
Cohort #14														1,157	763	663	584	520	465	419	379	344	313	
Cohort #15															1,415	1,097	932	811	714	635	569	512	463	420
Cohort #16																2,471	1,916	1,628	1,416	1,248	1,109	993	894	809
Cohort #17																	1,594	1,236	1,050	913	805	716	641	577
Cohort #18																		1,619	1,255	1,067	928	817	727	651
Cohort #19																			1,810	1,403	1,193	1,037	914	813
Cohort #20																				1,904	1,476	1,255	1,091	961
Cohort #21																					1,681	1,303	1,108	963
Cohort #22																						1,629	1,263	1,073
Cohort #23																							1,840	1,426
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,337	41,711	41,890	41,709	41,422	41,353	40,692	39,880	38,845	37,739	36,720	35,676	34,709	34,083	34,521	33,872	33,348	33,046	32,820	32,348	31,864	31,625	31,639

Table 2g: Sprint Nextel’s 2-Segment Weibull with Covariates (2W_C) Subscriber Data Structure

2W_C	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
SPRINT NEXTEL																								
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,538	34,278	32,356	30,573	29,220	27,741	26,397	25,102	24,094	22,973	21,939	20,930	20,138	19,249	18,425	17,616	16,977	16,257	15,586	14,925	14,401	13,809	13,256
Cohort #2		4,838	4,152	3,676	3,271	2,982	2,683	2,427	2,192	2,018	2,018	1,838	1,672	1,547	1,412	1,293	1,181	1,096	1,004	922	845	786	722	665
Cohort #3			3,261	2,806	2,474	2,245	2,012	1,815	1,635	1,502	1,362	1,362	1,237	1,143	1,042	953	870	807	739	678	621	577	530	487
Cohort #4				3,010	2,577	2,320	2,069	1,858	1,669	1,530	1,385	1,258	1,258	1,161	1,057	966	880	816	746	684	626	582	534	491
Cohort #5					2,657	2,335	2,063	1,843	1,649	1,508	1,361	1,234	1,117	1,117	1,016	927	844	781	714	654	598	555	509	468
Cohort #6						2,512	2,155	1,909	1,698	1,548	1,393	1,260	1,138	1,047	1,047	954	868	803	733	671	613	569	521	479
Cohort #7							2,698	2,322	2,047	1,857	1,665	1,501	1,353	1,243	1,127	1,127	1,023	946	862	789	720	667	611	561
Cohort #8								2,140	1,832	1,650	1,471	1,321	1,186	1,088	984	894	804	725	652	587	526	480	431	387
Cohort #9									1,886	1,657	1,464	1,308	1,170	1,070	966	876	793	793	721	658	599	555	507	464
Cohort #10										1,558	1,337	1,184	1,053	960	864	781	706	650	600	562	538	498	455	416
Cohort #11											1,351	1,163	1,025	930	834	752	677	623	564	504	453	412	375	339
Cohort #12												1,308	1,119	1,008	899	807	725	665	601	546	499	459	420	383
Cohort #13													1,184	1,040	919	821	734	672	606	550	497	457	413	
Cohort #14														1,157	993	879	782	713	642	580	524	483	443	400
Cohort #15															1,415	1,218	1,073	974	873	787	709	652	591	531
Cohort #16																2,471	2,115	1,905	1,698	1,525	1,370	1,256	1,137	1,032
Cohort #17																	1,594	1,401	1,238	1,106	989	905	817	740
Cohort #18																		1,619	1,389	1,230	1,094	998	898	812
Cohort #19																			1,810	1,558	1,373	1,246	1,117	1,007
Cohort #20																				1,904	1,630	1,468	1,308	1,175
Cohort #21																					1,681	1,477	1,305	1,166
Cohort #22																						1,629	1,398	1,238
Cohort #23																							1,840	1,583
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,376	41,691	41,849	41,552	41,614	41,421	40,709	39,709	38,923	37,779	36,675	35,442	34,650	33,825	34,143	33,376	33,064	32,599	32,271	31,638	31,359	30,965	30,903

Table 2h: Sprint Nextel's 2-Segment Weibull-Gamma with Covariates (2WG_C) Subscriber Data Structure

2WG_C	2006				2007				2008				2009				2010				2011			
SPRINT NEXTEL	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		4,838	3,261	3,010	2,657	2,512	2,698	2,140	1,886	1,558	1,351	1,308	1,184	1,157	1,415	2,471	1,594	1,619	1,810	1,904	1,681	1,629	1,840	2,117
Actual Postpaid Subscribers	39,103	41,405	41,675	41,805	41,585	41,601	41,434	40,751	39,681	38,905	37,783	36,678	35,428	34,437	33,636	33,967	33,389	33,161	33,054	33,112	32,998	32,897	32,853	33,014
Cohort #1	39,103	36,512	35,109	34,050	33,109	32,443	31,737	31,105	30,488	30,023	29,508	29,032	28,554	28,186	27,772	27,383	26,988	26,680	26,330	25,999	25,660	25,395	25,091	24,801
Cohort #2		4,838			2,003	1,862	1,150	1,110	910	778	420	354	297	258	219	188	159	140	120	104	89	79	68	59
Cohort #3			3,261	2,967	1,713	1,401	1,124	915	744	633	526	287	240	208	176	150	127	111	95	82	70	62	54	47
Cohort #4					2,044	1,630	1,285	1,035	833	704	581	485	255	220	186	158	133	116	100	86	73	64	56	48
Cohort #5				3,010	2,657	1,941	1,486	1,176	934	783	642	532	438	260	219	185	156	136	116	99	84	74	64	55
Cohort #6						2,512	1,733	1,333	1,040	863	701	576	472	404	218	184	154	134	114	97	83	73	62	54
Cohort #7							2,698	1,873					616	524	435	238	198	172	146	124	105	92	79	68
Cohort #8								2,140	1,453	1,159	914	736	592	500	413	345	381	357	312	312	285	251	217	183
Cohort #9									1,886	1,378	1,055	834	663	556	456	378	311	285	255	231	211	196	182	167
Cohort #10										1,558	1,075	827	645	535	435	358	293	251	215	184	161	146	131	116
Cohort #11											1,351	938	710	580	466	379	308	262	218	184	159	141	126	111
Cohort #12												1,308	888	708	558	449	362	306	253	211	181	166	151	136
Cohort #13													1,184	865	662	524	416	349	286	237	195	176	161	146
Cohort #14														1,157	799	614	479	398	323	266	218	188	168	148
Cohort #15															1,415	982	743	608	488	397	323	275	228	181
Cohort #16																2,471	1,678	1,338	1,055	849	684	578	477	398
Cohort #17																	1,594	1,165	891	705	560	470	385	319
Cohort #18																		1,619	1,117	859	670	556	452	372
Cohort #19																			1,810	1,257	951	778	624	508
Cohort #20																				1,904	1,293	1,031	813	655
Cohort #21																					1,681	1,228	940	744
Cohort #22																						1,629	1,124	864
Cohort #23																							1,840	1,277
Cohort #24																								2,117
Total Expected Subscribers	39,103	41,350	41,709	41,892	41,526	41,590	41,413	40,688	39,704	39,038	37,703	36,667	35,553	34,963	34,428	34,984	34,281	34,125	33,884	33,753	33,250	33,129	32,931	33,001

Table 3a: Verizon's Exponential (E) Subscriber Data Structure

E	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,402	46,081	44,798	43,550	42,337	41,158	40,011	38,897	37,813	36,760	35,736	34,741	33,773	32,832	31,918	31,029	30,164	29,324	28,507	27,713	26,941	26,191	25,461
Cohort #2		5,163		4,879	4,743	4,611	4,483	4,358	4,236	4,118	4,004	3,892	3,784	3,678	3,576	3,476	3,379	3,285	3,194	3,105	3,018	2,934	2,853	2,773
Cohort #3			1,632		1,542	1,499	1,458	1,417	1,378	1,339	1,302	1,266	1,230	1,196	1,163	1,130	1,099	1,068	1,039	1,010	981	954	928	902
Cohort #4					3,306	3,214	3,125	3,038	2,953	2,871	2,791	2,713	2,638	2,564	2,493	2,423	2,356	2,290	2,226	2,164	2,104	2,045	1,988	1,933
Cohort #5					2,897	2,816	2,738	2,662	2,587	2,515	2,445	2,377	2,311	2,247	2,184	2,123	2,064	2,007	1,951	1,896	1,843	1,792	1,742	1,694
Cohort #6						3,051	2,966	2,883	2,803	2,725	2,649	2,575	2,504	2,434	2,366	2,300	2,236	2,174	2,113	2,054	1,997	1,941	1,887	1,835
Cohort #7							3,386	3,292	3,200	3,111	3,024	2,940	2,858	2,779	2,701	2,626	2,553	2,482	2,413	2,345	2,280	2,217	2,155	2,095
Cohort #8								3,400	3,305	3,213	3,124	3,037	2,952	2,870	2,790	2,712	2,637	2,563	2,492	2,422	2,355	2,289	2,226	2,164
Cohort #9									2,920	2,839	2,760	2,683	2,608	2,536	2,465	2,396	2,330	2,265	2,202	2,140	2,081	2,023	1,966	1,912
Cohort #10										3,070	2,984	2,901	2,820	2,742	2,666	2,591	2,519	2,449	2,381	2,314	2,250	2,187	2,126	2,067
Cohort #11											4,053	3,940	3,830	3,724	3,620	3,519	3,421	3,326	3,233	3,143	3,056	2,970	2,888	2,807
Cohort #12												3,181	3,093	3,007	2,923	2,842	2,762	2,685	2,611	2,538	2,467	2,398	2,332	2,267
Cohort #13													14,488	14,085	13,693	13,311	12,940	12,580	12,229	11,889	11,558	11,236	10,923	10,619
Cohort #14														1,845	1,793	1,743	1,695	1,647	1,602	1,557	1,514	1,471	1,430	1,391
Cohort #15															3,626	3,525	3,427	3,332	3,239	3,149	3,061	2,976	2,893	2,812
Cohort #16																3,642	3,540	3,442	3,346	3,253	3,162	3,074	2,988	2,905
Cohort #17																	2,959	2,877	2,797	2,719	2,643	2,569	2,498	2,428
Cohort #18																		2,928	2,846	2,767	2,690	2,615	2,542	2,471
Cohort #19																			3,313	3,221	3,131	3,044	2,959	2,877
Cohort #20																				3,280	3,188	3,099	3,013	
Cohort #21																				3,438	3,343	3,250	3,159	
Cohort #22																					3,519	3,421	3,326	
Cohort #23																						3,303	3,211	
Cohort #24																							3,654	
Total Expected Subscribers	48,760	52,565	52,732	54,665	56,039	57,529	59,313	61,061	62,280	63,615	65,896	67,242	79,858	79,478	80,890	82,279	82,946	83,564	84,550	85,568	86,623	87,729	88,588	89,775

Table 3b: Verizon's Weibull (W) Subscriber Data Structure

W	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,401	46,079	44,795	43,547	42,333	41,153	40,007	38,892	37,809	36,755	35,732	34,736	33,769	32,828	31,914	31,026	30,162	29,322	28,506	27,712	26,941	26,191	25,462
Cohort #2		5,163	5,026	4,888	4,753	4,619	4,489	4,362	4,237	4,116	3,998	3,883	3,771	3,662	3,556	3,453	3,352	3,254	3,159	3,067	2,977	2,890	2,805	2,723
Cohort #3			1,632	1,589	1,545	1,502	1,460	1,419	1,379	1,339	1,301	1,264	1,227	1,192	1,158	1,124	1,091	1,060	1,029	999	970	941	914	887
Cohort #4				3,401	3,311	3,220	3,131	3,043	2,957	2,873	2,792	2,712	2,634	2,558	2,484	2,412	2,343	2,274	2,208	2,144	2,081	2,020	1,961	1,904
Cohort #5					2,897	2,820	2,743	2,667	2,592	2,519	2,447	2,378	2,310	2,243	2,179	2,116	2,055	1,995	1,937	1,881	1,826	1,773	1,721	1,671
Cohort #6						3,051	2,970	2,889	2,809	2,730	2,653	2,578	2,504	2,433	2,363	2,295	2,229	2,164	2,101	2,040	1,981	1,923	1,867	1,812
Cohort #7							3,386	3,297	3,206	3,117	3,030	2,944	2,861	2,779	2,700	2,622	2,547	2,473	2,402	2,332	2,265	2,199	2,135	2,072
Cohort #8								3,400	3,310	3,219	3,130	3,042	2,956	2,873	2,791	2,711	2,633	2,557	2,484	2,412	2,342	2,274	2,208	2,143
Cohort #9									2,920	2,843	2,765	2,688	2,613	2,539	2,467	2,397	2,328	2,262	2,197	2,133	2,072	2,011	1,953	1,896
Cohort #10										3,070	2,989	2,907	2,826	2,747	2,669	2,594	2,520	2,448	2,377	2,309	2,242	2,178	2,114	2,053
Cohort #11											4,053	3,946	3,838	3,731	3,627	3,524	3,424	3,327	3,232	3,139	3,048	2,961	2,875	2,792
Cohort #12												3,181	3,097	3,012	2,929	2,847	2,766	2,688	2,611	2,537	2,464	2,393	2,324	2,257
Cohort #13													14,488	14,105	13,719	13,338	12,964	12,598	12,240	11,892	11,552	11,220	10,897	10,583
Cohort #14														1,845	1,796	1,747	1,698	1,650	1,604	1,558	1,514	1,471	1,428	1,387
Cohort #15															3,626	3,571	3,516	3,461	3,406	3,353	3,300	3,247	3,194	3,141
Cohort #16																3,642	3,546	3,448	3,353	3,259	3,167	3,077	2,989	2,904
Cohort #17																	2,959	2,881	2,802	2,724	2,648	2,573	2,500	2,429
Cohort #18																		2,928	2,850	2,772	2,695	2,620	2,546	2,473
Cohort #19																			3,313	3,226	3,137	3,050	2,965	2,881
Cohort #20																				3,374	3,284	3,194	3,106	3,019
Cohort #21																					3,438	3,347	3,256	3,165
Cohort #22																						3,519	3,426	3,332
Cohort #23																							3,303	3,215
Cohort #24																								3,654
Total Expected Subscribers	48,760	52,633	52,828	54,765	56,134	57,611	59,374	61,097	62,287	63,589	65,832	67,139	79,712	79,303	80,671	82,011	82,625	83,186	84,112	85,069	86,061	87,104	87,898	89,018

Table 3c: Verizon's Exponential-Gamma (EG) Subscriber Data Structure

EG	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,401	46,079	44,795	43,547	42,333	41,153	40,007	38,892	37,809	36,755	35,732	34,736	33,769	32,828	31,914	31,026	30,162	29,322	28,506	27,712	26,941	26,191	25,462
Cohort #2		5,163	5,019	4,879	4,743	4,611	4,482	4,357	4,236	4,118	4,003	3,892	3,783	3,678	3,575	3,476	3,379	3,285	3,194	3,105	3,018	2,934	2,853	2,773
Cohort #3			1,632	1,586	1,542	1,499	1,457	1,417	1,377	1,339	1,302	1,265	1,230	1,196	1,163	1,130	1,099	1,068	1,038	1,009	981	954	928	902
Cohort #4				3,401	3,306	3,214	3,125	3,037	2,953	2,871	2,791	2,713	2,637	2,564	2,492	2,423	2,355	2,290	2,226	2,164	2,104	2,045	1,988	1,933
Cohort #5					2,897	2,816	2,738	2,661	2,587	2,515	2,445	2,377	2,311	2,246	2,184	2,123	2,064	2,006	1,950	1,896	1,843	1,792	1,742	1,694
Cohort #6						3,051	2,966	2,883	2,803	2,725	2,649	2,575	2,503	2,434	2,366	2,300	2,236	2,173	2,113	2,054	1,997	1,941	1,887	1,835
Cohort #7							3,386	3,292	3,200	3,111	3,024	2,940	2,858	2,778	2,701	2,626	2,553	2,481	2,412	2,345	2,280	2,216	2,155	2,095
Cohort #8								3,400	3,305	3,213	3,124	3,037	2,952	2,870	2,790	2,712	2,636	2,563	2,492	2,422	2,355	2,289	2,225	2,163
Cohort #9									2,920	2,839	2,760	2,683	2,608	2,536	2,465	2,396	2,329	2,265	2,201	2,140	2,081	2,023	1,966	1,911
Cohort #10										3,070	2,984	2,901	2,820	2,742	2,665	2,591	2,519	2,449	2,380	2,314	2,250	2,187	2,126	2,067
Cohort #11											4,053	3,940	3,830	3,724	3,620	3,519	3,421	3,325	3,233	3,143	3,055	2,970	2,887	2,807
Cohort #12												3,181	3,093	3,007	2,923	2,841	2,762	2,685	2,610	2,538	2,467	2,398	2,331	2,266
Cohort #13													14,488	14,085	13,692	13,310	12,939	12,579	12,228	11,888	11,556	11,234	10,921	10,617
Cohort #14														1,845	1,793	1,743	1,695	1,647	1,601	1,557	1,513	1,471	1,430	1,390
Cohort #15															3,626	3,525	3,427	3,332	3,239	3,148	3,061	2,975	2,893	2,812
Cohort #16																3,642	3,540	3,442	3,346	3,253	3,162	3,074	2,988	2,905
Cohort #17																	2,959	2,877	2,796	2,719	2,643	2,569	2,498	2,428
Cohort #18																		2,928	2,846	2,767	2,690	2,615	2,542	2,471
Cohort #19																			3,313	3,221	3,131	3,044	2,959	2,877
Cohort #20																				3,374	3,279	3,188	3,099	3,013
Cohort #21																					3,438	3,343	3,249	3,159
Cohort #22																						3,519	3,421	3,326
Cohort #23																							3,303	3,211
Cohort #24																								3,654
Total Expected Subscribers	48,760	52,563	52,730	54,662	56,035	57,524	59,308	61,055	62,274	63,609	65,890	67,235	79,851	79,471	80,883	82,272	82,939	83,556	84,543	85,561	86,617	87,724	88,583	89,771

Table 3d: Verizon's Weibull-Gamma (WG) Subscriber Data Structure

WG	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,473	46,171	44,887	43,628	42,396	41,193	40,019	38,875	37,760	36,675	35,618	34,590	33,590	32,617	31,671	30,751	29,857	28,988	28,143	27,323	26,525	25,751	24,998
Cohort #2		5,163	5,026	4,889	4,753	4,619	4,489	4,362	4,237	4,116	3,998	3,883	3,771	3,662	3,557	3,453	3,353	3,256	3,161	3,069	2,980	2,893	2,809	2,727
Cohort #3			1,632	1,589	1,545	1,502	1,460	1,419	1,379	1,339	1,301	1,264	1,227	1,192	1,158	1,124	1,092	1,060	1,029	999	970	942	914	888
Cohort #4				3,401	3,311	3,220	3,131	3,043	2,957	2,873	2,791	2,712	2,634	2,558	2,484	2,413	2,343	2,275	2,209	2,145	2,083	2,022	1,963	1,906
Cohort #5					2,897	2,820	2,743	2,667	2,592	2,519	2,447	2,378	2,310	2,243	2,179	2,116	2,055	1,996	1,938	1,882	1,827	1,774	1,722	1,672
Cohort #6						3,051	2,970	2,889	2,809	2,730	2,653	2,577	2,504	2,432	2,363	2,295	2,229	2,164	2,102	2,041	1,982	1,924	1,868	1,814
Cohort #7							3,386	3,297	3,206	3,117	3,030	2,944	2,861	2,779	2,700	2,622	2,547	2,474	2,402	2,333	2,265	2,199	2,136	2,073
Cohort #8								3,400	3,310	3,220	3,130	3,042	2,956	2,872	2,791	2,711	2,633	2,557	2,484	2,412	2,342	2,274	2,208	2,144
Cohort #9									2,920	2,843	2,765	2,688	2,613	2,539	2,467	2,397	2,328	2,262	2,197	2,133	2,072	2,012	1,954	1,897
Cohort #10										3,070	2,989	2,907	2,826	2,747	2,669	2,594	2,520	2,448	2,377	2,309	2,243	2,178	2,115	2,054
Cohort #11											4,053	3,946	3,838	3,731	3,627	3,524	3,424	3,327	3,231	3,139	3,049	2,961	2,875	2,792
Cohort #12												3,181	3,097	3,013	2,929	2,847	2,766	2,688	2,611	2,536	2,464	2,393	2,324	2,257
Cohort #13													14,488	14,106	13,719	13,338	12,964	12,598	12,240	11,891	11,551	11,220	10,898	10,584
Cohort #14														1,845	1,796	1,747	1,698	1,650	1,604	1,558	1,514	1,471	1,428	1,387
Cohort #15															3,626	3,531	3,434	3,338	3,245	3,153	3,064	2,976	2,891	2,808
Cohort #16																3,546	3,449	3,353	3,259	3,167	3,077	2,989	2,904	2,820
Cohort #17																	2,959	2,881	2,802	2,724	2,648	2,573	2,500	2,429
Cohort #18																		2,928	2,850	2,772	2,695	2,620	2,546	2,473
Cohort #19																			3,313	3,226	3,138	3,050	2,965	2,881
Cohort #20																				3,284	3,194	3,106	3,018	2,931
Cohort #21																				3,438	3,348	3,256	3,165	3,074
Cohort #22																					3,519	3,427	3,333	3,240
Cohort #23																						3,303	3,207	3,111
Cohort #24																							3,003	2,907
Total Expected Subscribers	48,760	52,635	52,829	54,766	56,134	57,610	59,373	61,096	62,286	63,588	65,833	67,141	79,716	79,310	80,681	82,023	82,642	83,206	84,137	85,099	86,097	87,145	87,946	89,073

Table 3e: Verizon's 2-Segment Weibull (2W) Subscriber Data Structure

ZW	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,412	46,406	45,509	44,682	43,906	43,170	42,468	41,795	41,147	40,522	39,918	39,332	38,763	38,210	37,672	37,148	36,636	36,138	35,651	35,174	34,709	34,254	33,808
Cohort #2		5,163	4,645	4,354	4,122	3,923	3,748	3,591	3,447	3,316	3,194	3,080	2,974	2,875	2,781	2,692	2,608	2,528	2,452	2,380	2,311	2,245	2,182	2,122
Cohort #3			1,632	1,468	1,376	1,303	1,240	1,185	1,135	1,090	1,048	1,010	974	940	909	879	851	824	799	775	752	730	710	690
Cohort #4				3,401	3,060	2,869	2,715	2,584	2,469	2,365	2,271	2,184	2,104	2,029	1,959	1,894	1,832	1,773	1,718	1,665	1,615	1,568	1,522	1,479
Cohort #5					2,897	2,607	2,443	2,313	2,201	2,103	2,015	1,934	1,861	1,792	1,728	1,669	1,613	1,560	1,510	1,463	1,419	1,376	1,335	1,297
Cohort #6						3,051	2,745	2,573	2,436	2,318	2,215	2,122	2,037	1,959	1,887	1,820	1,758	1,699	1,643	1,591	1,541	1,494	1,449	1,406
Cohort #7							3,386	3,047	2,856	2,703	2,573	2,458	2,355	2,261	2,175	2,095	2,020	1,951	1,885	1,824	1,766	1,710	1,658	1,608
Cohort #8								3,400	3,059	2,868	2,714	2,584	2,468	2,365	2,270	2,184	2,103	2,029	1,959	1,893	1,831	1,773	1,717	1,665
Cohort #9									2,920	2,628	2,463	2,332	2,219	2,120	2,031	1,950	1,876	1,807	1,742	1,682	1,626	1,573	1,523	1,475
Cohort #10										3,070	2,762	2,589	2,451	2,333	2,229	2,135	2,050	1,972	1,899	1,832	1,769	1,709	1,653	1,601
Cohort #11											4,053	3,647	3,418	3,236	3,080	2,942	2,819	2,706	2,603	2,507	2,418	2,335	2,257	2,183
Cohort #12												3,181	2,863	2,683	2,540	2,417	2,310	2,213	2,124	2,043	1,968	1,898	1,833	1,771
Cohort #13													14,488	13,036	12,220	11,567	11,009	10,518	10,076	9,674	9,305	8,963	8,644	8,347
Cohort #14														1,845	1,660	1,556	1,473	1,402	1,339	1,283	1,232	1,185	1,141	1,101
Cohort #15															3,626	3,263	3,059	2,895	2,756	2,633	2,522	2,422	2,329	2,243
Cohort #16																3,642	3,277	3,072	2,907	2,767	2,644	2,533	2,432	2,339
Cohort #17																	2,959	2,663	2,496	2,362	2,249	2,148	2,058	1,976
Cohort #18																		2,928	2,634	2,469	2,337	2,225	2,125	2,036
Cohort #19																			3,313	2,981	2,795	2,645	2,518	2,405
Cohort #20																				3,035	2,845	2,693	2,563	2,445
Cohort #21																				3,438	3,094	2,900	2,745	2,600
Cohort #22																					3,519	3,167	2,968	2,772
Cohort #23																						3,303	2,907	2,600
Cohort #24																							3,003	2,600
Total Expected Subscribers	48,760	52,574	52,683	54,733	56,137	57,658	59,448	61,161	62,319	63,608	65,831	67,039	79,544	78,237	79,305	80,376	80,763	81,175	81,996	82,851	83,748	84,700	85,404	86,454

Table 3f: Verizon's 2-Segment Weibull-Gamma (2WG) Subscriber Data Structure

2WG	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,413	46,415	45,527	44,711	43,946	43,223	42,534	41,874	41,240	40,629	40,039	39,468	38,914	38,377	37,854	37,345	36,850	36,367	35,895	35,435	34,985	34,546	34,116
Cohort #2		5,163	4,635	4,340	4,104	3,904	3,727	3,569	3,426	3,294	3,172	3,058	2,952	2,853	2,759	2,671	2,588	2,508	2,433	2,361	2,293	2,228	2,166	2,106
Cohort #3			1,632	1,465	1,372	1,297	1,234	1,178	1,128	1,083	1,041	1,003	967	933	902	872	844	818	793	769	746	725	704	685
Cohort #4				3,401	3,053	2,859	2,704	2,572	2,456	2,351	2,257	2,170	2,089	2,015	1,945	1,879	1,818	1,760	1,705	1,652	1,603	1,556	1,511	1,468
Cohort #5					2,897	2,601	2,435	2,303	2,191	2,092	2,003	1,922	1,848	1,780	1,716	1,657	1,601	1,548	1,499	1,452	1,408	1,365	1,325	1,287
Cohort #6						3,051	2,739	2,565	2,425	2,307	2,203	2,109	2,024	1,946	1,874	1,807	1,745	1,686	1,631	1,579	1,529	1,482	1,438	1,396
Cohort #7							3,386	3,040	2,846	2,692	2,560	2,445	2,341	2,247	2,160	2,080	2,006	1,936	1,871	1,810	1,752	1,697	1,645	1,596
Cohort #8								3,400	3,052	2,858	2,703	2,571	2,455	2,351	2,256	2,169	2,089	2,014	1,944	1,879	1,817	1,759	1,704	1,652
Cohort #9									2,920	2,622	2,455	2,322	2,208	2,109	2,019	1,938	1,863	1,794	1,730	1,670	1,614	1,561	1,511	1,464
Cohort #10										3,070	2,756	2,580	2,441	2,321	2,216	2,122	2,037	1,958	1,886	1,819	1,756	1,696	1,641	1,588
Cohort #11											4,053	3,639	3,407	3,222	3,065	2,926	2,802	2,689	2,586	2,490	2,401	2,318	2,240	2,166
Cohort #12												3,181	2,856	2,674	2,529	2,406	2,297	2,200	2,111	2,030	1,954	1,885	1,819	1,758
Cohort #13													14,488	13,007	12,179	11,518	10,955	10,461	10,017	9,613	9,243	8,901	8,583	8,285
Cohort #14														1,845	1,656	1,550	1,466	1,395	1,332	1,275	1,224	1,177	1,133	1,093
Cohort #15															3,626	3,256	3,048	2,883	2,742	2,618	2,507	2,406	2,314	2,228
Cohort #16																3,642	3,270	3,061	2,895	2,754	2,629	2,518	2,416	2,323
Cohort #17																	2,959	2,657	2,487	2,352	2,238	2,136	2,046	1,963
Cohort #18																		2,928	2,628	2,461	2,327	2,214	2,114	2,024
Cohort #19																			3,313	2,975	2,785	2,634	2,505	2,392
Cohort #20																				3,029	2,836	2,682	2,551	
Cohort #21																					3,438	3,087	2,890	2,733
Cohort #22																						3,519	3,160	2,958
Cohort #23																							3,303	2,965
Cohort #24																								3,654
Total Expected Subscribers	48,760	52,576	52,681	54,733	56,137	57,658	59,448	61,161	62,319	63,608	65,832	67,039	79,545	78,216	79,280	80,348	80,733	81,146	81,970	82,828	83,729	84,685	85,394	86,451

Table 3g: Verizon's 2-Segment Weibull with Covariates (2W_C) Subscriber Data Structure

2W_C	2006				2007				2008				2009				2010				2011			
VERIZON WIRELESS	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,466	46,211	45,034	43,988	43,049	42,033	41,047	40,154	39,342	38,456	37,590	36,802	36,082	35,293	34,520	33,815	33,169	32,460	31,763	31,127	30,543	29,902	29,271
Cohort #2		5,163	4,887	4,668	4,484	4,325	4,157	3,999	3,859	3,735	3,481	3,358	3,247	3,148	3,041	2,938	2,845	2,761	2,670	2,583	2,503	2,432	2,354	2,279
Cohort #3			1,632	1,544	1,479	1,424	1,367	1,314	1,267	1,226	1,181	1,100	1,064	1,031	995	961	931	903	873	844	818	794	769	744
Cohort #4				3,401	3,229	3,101	2,972	2,852	2,748	2,656	2,558	2,464	2,306	2,234	2,156	2,081	2,014	1,954	1,889	1,826	1,769	1,717	1,662	1,608
Cohort #5					2,897	2,759	2,637	2,526	2,430	2,347	2,258	2,174	2,099	1,972	1,903	1,836	1,777	1,723	1,665	1,609	1,558	1,513	1,463	1,416
Cohort #6						3,051	2,888	2,759	2,650	2,556	2,457	2,363	2,281	2,207	2,057	1,984	1,919	1,860	1,797	1,736	1,681	1,632	1,578	1,526
Cohort #7							3,386	3,204	3,069	2,955	2,837	2,727	2,629	2,543	2,451	2,283	2,207	2,139	2,065	1,994	1,931	1,873	1,811	1,751
Cohort #8								3,400	3,228	3,100	2,971	2,852	2,747	2,655	2,557	2,463	2,305	2,233	2,155	2,081	2,014	1,953	1,888	1,825
Cohort #9									2,920	2,782	2,658	2,546	2,450	2,366	2,276	2,192	2,116	1,988	1,918	1,851	1,791	1,737	1,678	1,622
Cohort #10										3,070	2,906	2,776	2,666	2,572	2,472	2,378	2,295	2,221	2,070	1,997	1,931	1,872	1,808	1,747
Cohort #11											4,053	3,835	3,674	3,537	3,396	3,264	3,147	3,044	2,933	2,733	2,642	2,560	2,472	2,387
Cohort #12												3,181	3,021	2,901	2,780	2,668	2,571	2,484	2,393	2,305	2,157	2,089	2,017	1,947
Cohort #13													14,488	13,800	13,186	12,632	12,155	11,736	11,294	10,873	10,500	9,865	9,518	9,184
Cohort #14														1,845	1,746	1,668	1,602	1,545	1,485	1,429	1,379	1,334	1,244	1,200
Cohort #15															3,626	3,431	3,287	3,165	3,039	2,920	2,816	2,723	2,625	2,445
Cohort #16																3,642	3,458	3,321	3,183	3,054	2,943	2,844	2,739	2,639
Cohort #17																	2,959	2,819	2,693	2,580	2,482	2,397	2,307	2,221
Cohort #18																		2,928	2,771	2,647	2,543	2,452	2,357	2,268
Cohort #19																			3,313	3,135	3,003	2,892	2,776	2,668
Cohort #20																				3,076	2,948	2,829		
Cohort #21																					3,438	3,275	3,129	2,998
Cohort #22																						3,519	3,332	3,182
Cohort #23																							3,303	3,125
Cohort #24																								3,654
Total Expected Subscribers	48,760	52,628	52,731	54,647	56,078	57,710	59,441	61,101	62,326	63,768	65,817	66,966	79,474	78,892	79,937	80,942	81,401	81,992	82,666	83,333	84,228	85,095	85,679	86,535

Table 3h: Verizon’s 2-Segment Weibull-Gamma with Covariates (2WG_C) Subscriber Data Structure

2WG_C	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
VERIZON WIRELESS																								
Implied Gross Wireless Additions-Postpaid		5,163	1,632	3,401	2,897	3,051	3,386	3,400	2,920	3,070	4,053	3,181	14,488	1,845	3,626	3,642	2,959	2,928	3,313	3,374	3,438	3,519	3,303	3,654
Actual Postpaid Subscribers	48,760	52,600	52,731	54,682	56,100	57,700	59,400	61,101	62,300	63,800	65,850	66,940	78,934	78,395	79,371	80,495	80,912	81,573	82,257	83,125	84,031	85,290	86,175	87,382
Cohort #1	48,760	47,469	46,250	45,122	44,138	43,265	42,336	41,443	40,645	39,927	39,153	38,402	37,726	37,114	36,450	35,803	35,218	34,685	34,107	33,540	33,026	32,557	32,047	31,545
Cohort #2		5,163	4,845	4,593	4,384	4,207	4,023	3,852	3,703	3,573	3,308	3,183	3,074	2,976	2,872	2,773	2,685	2,606	2,521	2,440	2,367	2,302	2,232	2,165
Cohort #3			1,632	1,530	1,456	1,393	1,330	1,271	1,221	1,176	1,130	1,045	1,008	975	941	907	878	852	824	797	773	751	728	705
Cohort #4				3,401	3,203	3,055	2,908	2,774	2,660	2,560	2,455	2,357	2,191	2,118	2,041	1,967	1,902	1,844	1,782	1,722	1,669	1,622	1,571	1,522
Cohort #5					2,897	2,737	2,596	2,470	2,364	2,272	2,176	2,086	2,008	1,874	1,804	1,738	1,679	1,627	1,571	1,518	1,470	1,427	1,382	1,338
Cohort #6						3,051	2,863	2,714	2,591	2,486	2,378	2,276	2,189	2,111	1,955	1,881	1,816	1,759	1,697	1,639	1,586	1,540	1,490	1,442
Cohort #7							3,386	3,176	3,020	2,891	2,760	2,638	2,533	2,441	2,344	2,168	2,092	2,024	1,952	1,883	1,822	1,767	1,709	1,653
Cohort #8								3,400	3,202	3,054	2,907	2,774	2,659	2,559	2,455	2,356	2,190	2,117	2,040	1,966	1,901	1,843	1,781	1,722
Cohort #9									2,920	2,760	2,617	2,490	2,383	2,290	2,194	2,103	2,024	1,890	1,819	1,752	1,693	1,640	1,584	1,530
Cohort #10										3,070	2,881	2,731	2,607	2,501	2,392	2,291	2,202	2,124	1,967	1,893	1,828	1,770	1,708	1,649
Cohort #11											4,053	3,801	3,615	3,461	3,303	3,158	3,032	2,921	2,806	2,595	2,504	2,422	2,336	2,254
Cohort #12												3,181	2,996	2,858	2,721	2,595	2,488	2,394	2,297	2,205	2,049	1,981	1,909	1,840
Cohort #13													14,488	13,691	12,984	12,355	11,822	11,361	10,883	10,434	10,042	9,374	9,025	8,692
Cohort #14														1,845	1,731	1,641	1,566	1,503	1,437	1,376	1,323	1,276	1,182	1,137
Cohort #15															3,626	3,401	3,235	3,096	2,955	2,825	2,713	2,614	2,510	2,322
Cohort #16																3,642	3,429	3,271	3,114	2,971	2,848	2,741	2,629	2,524
Cohort #17																	2,959	2,796	2,652	2,523	2,415	2,320	2,223	2,131
Cohort #18																		2,928	2,748	2,605	2,486	2,385	2,281	2,184
Cohort #19																			3,313	3,107	2,956	2,829	2,700	2,581
Cohort #20																				3,177	3,030	2,885	2,752	
Cohort #21																					3,438	3,249	3,081	2,932
Cohort #22																						3,519	3,303	3,131
Cohort #23																							3,303	3,097
Cohort #24																								3,654
Total Expected Subscribers	48,760	52,631	52,727	54,647	56,078	57,708	59,444	61,101	62,327	63,767	65,818	66,965	79,476	78,813	79,813	80,778	81,217	81,798	82,485	83,164	84,085	84,961	85,598	86,501

Table 4a: T-Mobile’s Exponential (E) Subscriber Data Structure

E	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
T-MOBILE																								
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,977	16,876	15,843	14,874	13,963	13,108	12,306	11,553	10,845	10,182	9,558	8,973	8,424	7,908	7,424	6,970	6,543	6,143	5,767	5,414	5,082	4,771	4,479
Cohort #2		1,788	1,678	1,575	1,479	1,388	1,303	1,224	1,149	1,078	1,012	950	892	838	786	738	693	651	611	573	538	505	474	445
Cohort #3			2,155	2,023	1,899	1,783	1,674	1,571	1,475	1,385	1,300	1,220	1,146	1,076	1,010	948	890	835	784	736	691	649	609	572
Cohort #4				2,095	1,966	1,846	1,733	1,627	1,527	1,434	1,346	1,264	1,186	1,114	1,046	982	921	865	812	762	716	672	631	592
Cohort #5					1,956	1,836	1,724	1,618	1,519	1,426	1,339	1,257	1,180	1,108	1,040	976	916	860	808	758	712	668	627	589
Cohort #6						1,890	1,774	1,666	1,564	1,468	1,378	1,294	1,215	1,140	1,071	1,005	943	886	832	781	733	688	646	606
Cohort #7							1,931	1,813	1,702	1,598	1,500	1,408	1,322	1,241	1,165	1,094	1,027	964	905	850	798	749	703	660
Cohort #8								2,005	1,882	1,767	1,659	1,557	1,462	1,372	1,288	1,209	1,135	1,066	1,001	939	882	828	777	730
Cohort #9									3,073	2,885	2,708	2,542	2,387	2,241	2,103	1,975	1,854	1,740	1,634	1,534	1,440	1,352	1,269	1,191
Cohort #10										2,006	1,883	1,768	1,660	1,558	1,463	1,373	1,289	1,210	1,136	1,067	1,001	940	882	828
Cohort #11											2,193	2,059	1,933	1,815	1,704	1,599	1,501	1,409	1,323	1,242	1,166	1,095	1,028	965
Cohort #12												2,187	2,054	1,928	1,810	1,699	1,595	1,497	1,406	1,320	1,239	1,163	1,092	1,025
Cohort #13													2,015	1,892	1,776	1,667	1,565	1,469	1,379	1,295	1,216	1,141	1,071	1,006
Cohort #14														1,838	1,725	1,620	1,520	1,427	1,340	1,258	1,181	1,109	1,041	977
Cohort #15															1,801	1,690	1,587	1,490	1,399	1,313	1,233	1,157	1,086	1,020
Cohort #16																1,895	1,779	1,670	1,568	1,472	1,382	1,297	1,218	1,143
Cohort #17																	1,644	1,543	1,449	1,360	1,277	1,198	1,125	1,056
Cohort #18																		1,868	1,754	1,646	1,546	1,451	1,362	1,279
Cohort #19																			1,864	1,750	1,643	1,542	1,448	1,359
Cohort #20																				1,673	1,571	1,474	1,384	1,299
Cohort #21																					1,411	1,325	1,244	1,167
Cohort #22																						1,741	1,634	1,534
Cohort #23																							1,664	1,562
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,764	20,709	21,536	22,174	22,707	23,248	23,829	25,443	25,892	26,500	27,066	27,424	27,583	27,695	27,894	27,830	27,995	28,145	28,095	27,787	27,827	27,787	27,628

Table 4b: T-Mobile’s Weibull (W) Subscriber Data Structure

W	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,858	16,738	15,716	14,773	13,899	13,084	12,324	11,613	10,947	10,323	9,738	9,189	8,672	8,187	7,730	7,301	6,896	6,516	6,157	5,819	5,500	5,199	4,916
Cohort #2		1,788	1,667	1,563	1,467	1,379	1,297	1,221	1,150	1,084	1,022	964	909	858	810	764	722	682	644	608	575	543	513	485
Cohort #3			2,155	2,010	1,884	1,769	1,663	1,564	1,472	1,387	1,307	1,232	1,162	1,096	1,034	976	921	870	822	776	733	693	655	619
Cohort #4				2,095	1,953	1,831	1,719	1,616	1,520	1,431	1,348	1,270	1,197	1,129	1,065	1,005	949	896	846	799	754	713	673	636
Cohort #5					1,956	1,824	1,709	1,605	1,509	1,419	1,336	1,259	1,186	1,118	1,054	995	938	886	836	790	746	704	665	629
Cohort #6						1,890		1,652	1,551	1,458	1,372	1,291	1,216	1,146	1,081	1,019	961	907	856	808	763	721	681	643
Cohort #7							1,931	1,801	1,688	1,585	1,490	1,402	1,319	1,243	1,171	1,104	1,041	982	927	875	826	780	736	695
Cohort #8								2,005	1,869	1,752	1,645	1,547	1,455	1,370	1,290	1,216	1,146	1,081	1,019	962	908	857	809	764
Cohort #9									3,073	2,866	2,686	2,522	2,371	2,230	2,099	1,977	1,863	1,757	1,657	1,563	1,474	1,392	1,314	1,240
Cohort #10										1,646	1,548	1,456	1,371	1,291	1,217	1,147	1,081	1,020	963	909	858			
Cohort #11											2,193	2,045	1,917	1,800	1,692	1,592	1,499	1,412	1,330	1,254	1,182	1,115	1,052	993
Cohort #12												2,187	2,040	1,912	1,795	1,688	1,588	1,495	1,408	1,327	1,251	1,179	1,112	1,050
Cohort #13													2,015	1,879	1,761	1,654	1,555	1,463	1,377	1,297	1,222	1,152	1,086	1,025
Cohort #14														1,838	1,714	1,606	1,508	1,418	1,334	1,256	1,183	1,114	1,051	991
Cohort #15																1,679	1,574	1,478	1,389	1,307	1,230	1,159	1,092	1,029
Cohort #16																1,895	1,767	1,656	1,555	1,462	1,375	1,295	1,219	1,149
Cohort #17																	1,644	1,533	1,437	1,349	1,268	1,193	1,123	1,058
Cohort #18																		1,868	1,742	1,633	1,533	1,441	1,356	1,276
Cohort #19																			1,864	1,738	1,629	1,530	1,438	1,353
Cohort #20																				1,673	1,560	1,462	1,373	1,291
Cohort #21																					1,411	1,316	1,233	1,158
Cohort #22																						1,741	1,623	1,522
Cohort #23																							1,664	1,552
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,646	20,560	21,383	22,033	22,591	23,166	23,788	25,446	25,936	26,593	27,210	27,623	27,839	28,010	28,271	28,267	28,493	28,704	28,713	28,463	28,562	28,579	28,475

Table 4c: T-Mobile’s Exponential-Gamma (EG) Subscriber Data Structure

EG	2006				2007				2008				2009				2010				2011			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,928	16,801	15,758	14,792	13,898	13,068	12,297	11,580	10,914	10,293	9,715	9,176	8,672	8,201	7,761	7,350	6,964	6,603	6,264	5,946	5,647	5,367	5,103
Cohort #2		1,788	1,674	1,568	1,471	1,381	1,297	1,220	1,148	1,081	1,019	961	907	857	810	766	725	686	650	616	585	555	527	501
Cohort #3			2,155	2,018	1,891	1,773	1,665	1,564	1,471	1,384	1,303	1,228	1,158	1,093	1,033	976	923	873	827	784	743	705	669	636
Cohort #4				2,095	1,961	1,838	1,724	1,618	1,520	1,429	1,345	1,267	1,194	1,126	1,063	1,004	949	897	849	804	762	722	685	650
Cohort #5					1,956	1,831	1,716	1,609	1,511	1,419	1,335	1,256	1,183	1,115	1,051	992	937	886	838	793	751	711	674	640
Cohort #6						1,890	1,770	1,658	1,555	1,460	1,372	1,290	1,214	1,143	1,077	1,016	959	906	856	810	766	725	687	652
Cohort #7							1,931	1,808	1,694	1,589	1,492	1,402	1,318	1,240	1,168	1,101	1,038	980	925	875	827	783	741	702
Cohort #8								2,005	1,877	1,759	1,650	1,549	1,455	1,368	1,287	1,212	1,143	1,078	1,017	961	908	859	812	769
Cohort #9									3,073	2,877	2,696	2,529	2,374	2,230	2,097	1,973	1,858	1,751	1,652	1,559	1,472	1,392	1,316	1,245
Cohort #10										2,006	1,878	1,760	1,651	1,550	1,456	1,369	1,288	1,213	1,143	1,078	1,018	961	908	859
Cohort #11											2,193	2,053	1,924	1,805	1,694	1,592	1,497	1,408	1,326	1,250	1,179	1,113	1,051	993
Cohort #12												2,187	2,048	1,919	1,800	1,690	1,588	1,493	1,405	1,323	1,247	1,176	1,110	1,048
Cohort #13													2,015	1,887	1,768	1,658	1,557	1,463	1,375	1,294	1,219	1,149	1,083	1,022
Cohort #14														1,838	1,720	1,612	1,512	1,420	1,334	1,254	1,180	1,111	1,047	988
Cohort #15																1,686	1,580	1,482	1,391	1,307	1,229	1,156	1,089	1,026
Cohort #16																1,895	1,774	1,662	1,559	1,464	1,375	1,293	1,217	1,146
Cohort #17																	1,644	1,539	1,442	1,353	1,270	1,193	1,122	1,055
Cohort #18																		1,868	1,749	1,639	1,537	1,443	1,356	1,275
Cohort #19																			1,864	1,745	1,635	1,534	1,440	1,353
Cohort #20																				1,673	1,566	1,468	1,377	1,292
Cohort #21																					1,411	1,321	1,238	1,161
Cohort #22																						1,741	1,630	1,527
Cohort #23																							1,664	1,558
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,716	20,629	21,438	22,071	22,611	23,170	23,779	25,429	25,919	26,576	27,196	27,616	27,842	28,026	28,303	28,319	28,568	28,805	28,844	28,625	28,758	28,811	28,745

Table 4d: T-Mobile's Weibull-Gamma (WG) Subscriber Data Structure

WG	2006				2007				2008				2009				2010				2011			
T-MOBILE	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,858	16,738	15,716	14,773	13,898	13,084	12,323	11,613	10,947	10,324	9,738	9,189	8,673	8,188	7,732	7,302	6,898	6,518	6,159	5,821	5,503	5,203	4,920
Cohort #2		1,788		1,563	1,467	1,379	1,297	1,221	1,150	1,084	1,022	964	909	858	810	764	722	682	644	608	575	543	514	486
Cohort #3			2,155	2,010	1,884	1,769	1,662	1,564	1,472	1,387	1,307	1,232	1,162	1,096	1,034	976	921	870	822	776	733	693	655	619
Cohort #4				2,095	1,953	1,831	1,719	1,616	1,520	1,431	1,348	1,270	1,197	1,129	1,065	1,005	949	896	846	799	755	713	674	637
Cohort #5					1,956	1,824	1,710	1,605	1,509	1,419	1,336	1,259	1,186	1,118	1,054	995	939	886	836	790	746	705	666	629
Cohort #6						1,890	1,763	1,652	1,551	1,458	1,372	1,291	1,216	1,146	1,081	1,019	961	907	856	808	763	721	681	643
Cohort #7							1,931	1,801	1,688	1,585	1,490	1,402	1,319	1,243	1,171	1,104	1,041	982	927	875	826	780	736	696
Cohort #8								2,005	1,869	1,752	1,645	1,547	1,455	1,370	1,290	1,216	1,146	1,081	1,019	962	908	857	809	764
Cohort #9									3,073	2,866	2,686	2,522	2,371	2,230	2,099	1,977	1,863	1,757	1,657	1,563	1,475	1,392	1,314	1,241
Cohort #10										2,006	1,871	1,754	1,646	1,548	1,456	1,371	1,291	1,217	1,147	1,081	1,020	963	909	858
Cohort #11												2,045	1,917	1,800	1,692	1,592	1,499	1,411	1,330	1,254	1,182	1,115	1,052	993
Cohort #12												2,187	2,040	1,912	1,795	1,688	1,588	1,495	1,408	1,327	1,251	1,179	1,112	1,050
Cohort #13													2,015	1,879	1,761	1,654	1,555	1,463	1,377	1,297	1,222	1,152	1,086	1,025
Cohort #14														1,838	1,714	1,606	1,508	1,418	1,334	1,256	1,183	1,114	1,051	991
Cohort #15																1,679	1,574	1,478	1,389	1,307	1,230	1,159	1,092	1,029
Cohort #16																1,895	1,767	1,656	1,555	1,462	1,375	1,295	1,219	1,149
Cohort #17																	1,644	1,533	1,437	1,349	1,268	1,193	1,123	1,058
Cohort #18																		1,868	1,742	1,633	1,533	1,441	1,356	1,276
Cohort #19																			1,864	1,738	1,629	1,530	1,438	1,353
Cohort #20																				1,673	1,560	1,462	1,373	1,291
Cohort #21																					1,411	1,316	1,233	1,158
Cohort #22																						1,741	1,633	1,532
Cohort #23																							1,664	1,552
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,646	20,560	21,383	22,033	22,591	23,166	23,788	25,446	25,936	26,593	27,211	27,624	27,840	28,012	28,272	28,269	28,496	28,707	28,716	28,467	28,567	28,584	28,481

Table 4e: T-Mobile's 2-Segment Weibull (2W) Subscriber Data Structure

2W	2006				2007				2008				2009				2010				2011			
T-MOBILE	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,824	16,478	15,191	13,978	12,844	11,788	10,809	9,902	9,065	8,293	7,582	6,929	6,328	5,777	5,271	4,808	4,384	3,996	3,641	3,316	3,019	2,748	2,501
Cohort #2		1,788		1,778	1,753	1,703	1,619	1,497	1,338	1,146	935	722	522	352	219	125	65	30	13	5	2	0	0	0
Cohort #3			2,155	2,154	2,144	2,114	2,053	1,952	1,805	1,612	1,382	1,128	870	630	425	264	151	78	37	15	6	2	1	0
Cohort #4				2,095	2,093	2,084	2,055	1,996	1,897	1,755	1,567	1,343	1,096	846	612	413	257	147	76	36	15	6	2	1
Cohort #5					1,956	1,955	1,945	1,918	1,863	1,772	1,638	1,463	1,254	1,023	790	572	385	240	137	71	33	14	5	2
Cohort #6						1,890	1,889	1,880	1,854	1,801	1,712	1,583	1,414	1,212	989	763	552	372	232	132	69	32	13	5
Cohort #7							1,931	1,930	1,921	1,894	1,840	1,749	1,618	1,445	1,238	1,011	780	564	380	237	135	70	33	14
Cohort #8								2,005	2,003	1,994	1,966	1,910	1,816	1,679	1,500	1,285	1,049	809	586	395	246	140	73	34
Cohort #9									3,073	3,071	3,056	3,014	2,927	2,783	2,574	2,299	1,970	1,608	1,241	898	605	377	215	112
Cohort #10										2,006	2,005	1,995	1,968	1,911	1,817	1,680	1,501	1,286	1,050	810	586	395	246	140
Cohort #11											2,193	2,192	2,182	2,151	2,089	1,987	1,837	1,641	1,406	1,148	885	641	432	269
Cohort #12												2,187	2,186	2,176	2,146	2,084	1,981	1,832	1,637	1,403	1,145	883	639	431
Cohort #13													2,015	2,014	2,005	1,977	1,920	1,825	1,688	1,508	1,292	1,054	814	589
Cohort #14														1,838	1,837	1,828	1,802	1,751	1,665	1,539	1,375	1,178	962	742
Cohort #15																1,800	1,791	1,766	1,715	1,631	1,508	1,347	1,154	942
Cohort #16																1,895	1,894	1,885	1,858	1,805	1,716	1,587	1,418	1,215
Cohort #17																	1,644	1,643	1,635	1,612	1,566	1,489	1,377	1,230
Cohort #18																		1,868	1,867	1,858	1,832	1,780	1,692	1,565
Cohort #19																			1,864	1,863	1,854	1,828	1,776	1,688
Cohort #20																				1,673	1,672	1,664	1,641	1,594
Cohort #21																					1,411	1,410	1,404	1,384
Cohort #22																						1,741	1,740	1,732
Cohort #23																							1,664	1,663
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,612	20,420	21,218	21,924	22,589	23,280	23,986	25,656	26,115	26,588	26,869	26,797	26,388	25,817	25,253	24,387	23,730	23,082	22,279	21,270	20,659	20,048	19,394

Table 4f: T-Mobile's 2-Segment Weibull-Gamma (2WG) Subscriber Data Structure

2WG	2006				2007				2008				2009				2010				2011			
T-MOBILE	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,871	16,508	15,183	13,922	12,737	11,632	10,605	9,656	8,781	7,977	7,239	6,564	5,946	5,383	4,869	4,401	3,976	3,590	3,239	2,921	2,632	2,371	2,135
Cohort #2		1,788		1,785	1,774	1,742	1,677	1,564	1,395	1,178	933	691	478	313	195	117	68	40	23	13	8	4	3	2
Cohort #3			2,155	2,155	2,152	2,138	2,100	2,021	1,885	1,682	1,420	1,125	833	577	377	235	141	83	48	27	16	9	5	3
Cohort #4				2,095	2,094	2,092	2,078	2,041	1,965	1,832	1,635	1,381	1,094	809	561	366	228	137	80	46	27	15	9	5
Cohort #5					1,956	1,956	1,953	1,940	1,906	1,835	1,711	1,527	1,289	1,021	756	524	342	213	128	75	43	25	14	8
Cohort #6						1,890	1,890	1,887	1,875	1,842	1,773	1,653	1,475	1,246	987	730	506	330	206	124	72	42	24	14
Cohort #7							1,931	1,931	1,928	1,916	1,882	1,811	1,689	1,507	1,273	1,008	746	517	338	210	126	74	43	25
Cohort #8								2,005	2,004	2,002	1,989	1,954	1,880	1,753	1,565	1,321	1,046	774	537	350	218	131	77	44
Cohort #9									3,073	3,072	3,068	3,049	2,995	2,882	2,688	2,399	2,025	1,604	1,187	823	537	334	201	118
Cohort #10										2,006	2,006	2,003	1,990	1,955	1,882	1,755	1,566	1,322	1,047	775	537	351	218	131
Cohort #11											2,193	2,193	2,190	2,176	2,138	2,057	1,918	1,712	1,446	1,145	847	587	383	239
Cohort #12												2,187	2,187	2,184	2,170	2,132	2,052	1,913	1,708	1,442	1,142	845	586	382
Cohort #13													2,015	2,015	2,012	1,999	1,964	1,890	1,763	1,573	1,328	1,052	779	539
Cohort #14														1,838	1,837	1,835	1,823	1,791	1,724	1,607	1,434	1,211	959	710
Cohort #15																1,800	1,798	1,786	1,755	1,689	1,575	1,406	1,187	940
Cohort #16																	1,895	1,892	1,880	1,847	1,777	1,657	1,479	1,249
Cohort #17																		1,644	1,643	1,641	1,631	1,602	1,542	1,438
Cohort #18																			1,868	1,865	1,853	1,821	1,752	1,634
Cohort #19																				1,864	1,861	1,849	1,817	1,748
Cohort #20																					1,673	1,671	1,660	1,631
Cohort #21																					1,411	1,411	1,409	1,400
Cohort #22																						1,741	1,741	1,738
Cohort #23																							1,664	1,664
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,658	20,450	21,217	21,898	22,555	23,261	23,995	25,688	26,147	26,588	26,813	26,680	26,223	25,622	25,042	24,164	23,493	22,830	22,018	21,010	20,411	19,818	19,185

Table 4g: T-Mobile's 2-Segment Weibull with Covariates (2W_C) Subscriber Data Structure

2W_C	2006				2007				2008				2009				2010				2011			
T-MOBILE	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,858	16,996	16,349	15,821	15,362	14,872	14,454	14,087	13,753	13,383	13,060	12,770	12,502	12,201	11,935	11,694	11,469	11,214	10,988	10,781	10,588	10,368	10,171
Cohort #2		1,788		1,180	1,111	1,059	1,010	971	939	912	478	465	454	443	432	423	414	407	398	391	384	378	371	365
Cohort #3			2,155	1,593	1,464	1,380	1,305	1,249	1,203	1,165	1,126	618	602	588	572	559	548	537	525	515	506	498	488	480
Cohort #4				2,095	1,575	1,451	1,354	1,285	1,233	1,189	1,145	1,109	630	614	597	582	570	558	546	535	525	516	506	497
Cohort #5					1,956	1,482	1,346	1,262	1,202	1,154	1,107	1,068	1,036	998	580	565	553	541	528	517	507	498	488	479
Cohort #6						1,890	1,365	1,248	1,174	1,120	1,068	1,027	993	964	505	491	480	469	457	447	438	430	421	413
Cohort #7							1,931	1,428	1,312	1,237	1,170	1,119	1,078	1,044	1,009	554	540	527	513	501	491	481	471	462
Cohort #8								2,005	1,507	1,388	1,296	1,230	1,180	1,138	1,096	1,061	603	588	571	557	545	534	522	512
Cohort #9									3,073	2,329	2,115	1,983	1,888	1,813	1,738	1,678	1,628	940	912	888	868	850	830	812
Cohort #10										2,006	1,488	1,324	1,246	1,188	1,133	1,090	1,054	1,024	536	522	509	498	485	475
Cohort #11											2,193	1,621	1,490	1,405	1,328	1,271	1,225	1,186	1,146	629	613	598	583	569
Cohort #12												2,187	1,645	1,515	1,414	1,342	1,287	1,242	1,196	1,158	658	641	623	608
Cohort #13													2,015	1,527	1,387	1,301	1,238	1,189	1,140	1,101	1,068	616	598	583
Cohort #14														1,838	1,327	1,213	1,142	1,089	1,038	998	966	938	491	478
Cohort #15																1,331	1,223	1,153	1,090	1,043	1,006	974	940	516
Cohort #16																	1,425	1,312	1,225	1,163	1,115	1,076	1,036	1,003
Cohort #17																		1,644	1,246	1,131	1,061	1,010	970	930
Cohort #18																			1,868	1,349	1,233	1,161	1,107	1,055
Cohort #19																				1,864	1,378	1,266	1,194	1,129
Cohort #20																					1,673	1,258	1,159	1,081
Cohort #21																					1,411	1,070	971	911
Cohort #22																						1,741	1,257	1,149
Cohort #23																							1,664	1,230
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,646	20,442	21,217	21,927	22,625	23,182	23,901	25,730	26,254	26,527	26,811	27,028	27,178	27,121	27,292	27,266	27,343	27,380	27,298	27,085	27,352	27,308	27,274

Table 4h: T-Mobile's 2-Segment Weibull-Gamma with Covariates (2WG_C) Subscriber Data Structure

2WG_C	2006				2007				2008				2009				2010				2011			
T-MOBILE	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		1,788	2,155	2,095	1,956	1,890	1,931	2,005	3,073	2,006	2,193	2,187	2,015	1,838	1,801	1,895	1,644	1,868	1,864	1,673	1,411	1,741	1,664	1,542
Actual Postpaid Subscribers	19,149	19,656	20,428	21,211	21,937	22,624	23,181	23,914	25,721	26,246	26,539	26,806	26,966	27,022	26,882	26,765	26,646	26,752	26,692	26,375	25,904	25,784	25,598	24,797
Cohort #1	19,149	17,857	16,983	16,326	15,789	15,321	14,824	14,400	14,028	13,689	13,316	12,990	12,698	12,428	12,126	11,859	11,617	11,391	11,138	10,911	10,705	10,512	10,294	10,098
Cohort #2		1,788		1,191	1,120	1,067	1,017	977	945	917	480	467	456	445	434	425	416	408	400	392	385	379	372	366
Cohort #3			2,155	1,607	1,476	1,390	1,314	1,256	1,210	1,170	1,130	620	604	589	574	560	548	538	526	515	506	498	488	480
Cohort #4				2,095	1,588	1,461	1,363	1,293	1,239	1,194	1,149	1,112	630	614	597	583	570	558	545	534	524	515	505	496
Cohort #5					1,956	1,493	1,355	1,270	1,208	1,159	1,111	1,072	1,039	998	980	965	952	940	927	916	906	897	887	878
Cohort #6						1,890	1,378	1,259	1,184	1,129	1,075	1,033	999	969	908	894	882	871	859	849	840	832	823	815
Cohort #7							1,931	1,440	1,323	1,246	1,177	1,125	1,084	1,049	1,012	955	941	928	914	902	891	882	871	862
Cohort #8								2,005	1,519	1,399	1,304	1,237	1,186	1,143	1,100	1,064	1,032	1,000	968	936	904	872	840	808
Cohort #9									3,073	2,346	2,129	1,995	1,898	1,821	1,745	1,684	1,632	1,580	1,528	1,476	1,424	1,372	1,320	1,268
Cohort #10										2,006	1,463	1,337	1,257	1,198	1,141	1,097	1,060	1,029	999	968	937	906	875	844
Cohort #11											2,193	1,636	1,502	1,415	1,337	1,278	1,231	1,191	1,150	1,110	1,070	1,030	990	950
Cohort #12												2,187	1,658	1,526	1,423	1,350	1,294	1,247	1,200	1,161	1,121	1,081	1,041	1,001
Cohort #13													2,015	1,539	1,396	1,308	1,245	1,194	1,144	1,104	1,064	1,024	984	944
Cohort #14														1,838	1,340	1,224	1,152	1,097	1,045	1,005	965	925	885	845
Cohort #15																1,801	1,233	1,162	1,098	1,049	1,011	978	944	910
Cohort #16																	1,436	1,322	1,233	1,169	1,121	1,080	1,039	1,006
Cohort #17																	1,644	1,255	1,139	1,067	1,015	974	933	901
Cohort #18																		1,868	1,362	1,245	1,171	1,115	1,063	1,021
Cohort #19																			1,864	1,390	1,277	1,203	1,136	1,086
Cohort #20																				1,673	1,268	1,167	1,088	1,032
Cohort #21																					1,411	1,077	978	916
Cohort #22																						1,741	1,269	1,160
Cohort #23																							1,664	1,241
Cohort #24																								1,542
Total Expected Subscribers	19,149	19,645	20,441	21,219	21,928	22,624	23,182	23,900	25,729	26,255	26,528	26,811	27,026	27,172	27,114	27,283	27,255	27,327	27,365	27,283	27,069	27,332	27,290	27,255

Table 5a: U.S. Cellular's Exponential (E) Subscriber Data Structure

E	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,730	4,505	4,292	4,088	3,894	3,710	3,534	3,366	3,207	3,055	2,910	2,772	2,640	2,515	2,396	2,282	2,174	2,071	1,973	1,879	1,790	1,705	1,625
Cohort #2		273	260	247	236	224	214	204	194	185	176	168	160	152	145	138	132	125	119	114	108	103	98	94
Cohort #3			405	385	367	350	333	317	302	288	274	261	249	237	226	215	205	195	186	177	169	161	153	146
Cohort #4				359	342	326	311	296	282	268	256	244	232	221	211	201	191	182	173	165	157	150	143	136
Cohort #5					314	299	285	271	258	246	234	223	213	203	193	184	175	167	159	151	144	137	131	125
Cohort #6						295	281	268	255	243	232	221	210	200	191	182	173	165	157	150	143	136	129	123
Cohort #7							426	406	387	368	351	334	318	303	289	275	262	250	238	227	216	206	196	187
Cohort #8								393	374	356	340	323	308	293	280	266	254	242	230	219	209	199	190	181
Cohort #9									282	269	256	244	232	221	211	201	191	182	173	165	157	150	143	136
Cohort #10										353	336	320	305	291	277	264	251	239	228	217	207	197	188	179
Cohort #11											(237)		(226)	(215)	(205)	(195)	(186)	(177)	(169)	(161)	(153)	(146)	(139)	(132)
Cohort #12												285	271	258	246	234	223	213	203	193	184	175	167	159
Cohort #13													822	783	746	711	677	645	614	585	557	531	506	482
Cohort #14														(235)	(224)	(213)	(203)	(193)	(184)	(175)	(167)	(159)	(152)	(144)
Cohort #15																286	272	259	247	235	224	214	204	194
Cohort #16																300	291	277	264	251	239	228	217	207
Cohort #17																	247	235	224	213	203	193	184	176
Cohort #18																		270	257	245	233	222	212	202
Cohort #19																			289	275	262	249	238	226
Cohort #20																				221	211	201	191	182
Cohort #21																					207	198	188	179
Cohort #22																						220	209	199
Cohort #23																							266	254
Cohort #24																								205
Total Expected Subscribers	4,965	5,002	5,169	5,284	5,347	5,389	5,559	5,688	5,701	5,783	5,260	5,295	5,867	5,354	5,400	5,449	5,438	5,449	5,480	5,441	5,390	5,354	5,367	5,318

Table 5b: U.S. Cellular's Weibull (W) Subscriber Data Structure

W	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,729	4,504	4,290	4,087	3,893	3,709	3,533	3,367	3,208	3,057	2,913	2,776	2,645	2,521	2,403	2,290	2,183	2,081	1,984	1,892	1,804	1,720	1,640
Cohort #2		273	260	248	236	225	214	204	194	185	176	167	159	152	144	138	131	125	119	113	107	102	97	93
Cohort #3			405	386	367	350	333	318	302	288	274	261	249	237	225	214	204	194	185	176	168	160	152	145
Cohort #4				359	342	326	311	296	282	269	256	243	232	221	210	200	190	181	173	164	156	149	142	135
Cohort #5					314	299	285	271	258	246	234	223	213	202	193	183	175	166	158	151	143	137	130	124
Cohort #6						295	282	268	256	243	232	221	210	200	191	181	173	164	157	149	142	135	129	122
Cohort #7							426	406	387	369	351	334	318	303	289	275	262	249	237	226	215	205	195	185
Cohort #8								393	374	357	340	324	308	294	280	266	253	241	230	219	208	198	189	180
Cohort #9									282	269	256	244	232	221	211	201	191	182	173	165	157	149	142	135
Cohort #10										353	336	321	305	291	277	264	251	239	228	217	206	197	187	178
Cohort #11											(249)	(237)	(226)	(215)	(205)	(195)	(186)	(177)	(169)	(160)	(153)	(145)	(139)	(132)
Cohort #12												285	271	259	246	235	223	213	203	193	184	175	166	158
Cohort #13													822	784	747	711	678	645	615	585	557	531	505	481
Cohort #14														(235)	(224)	(213)	(203)	(193)	(184)	(175)	(167)	(159)	(151)	(144)
Cohort #15																286	273	260	247	236	224	214	203	194
Cohort #16																305	291	277	264	252	240	228	217	207
Cohort #17																	247	235	224	213	203	194	184	176
Cohort #18																		270	257	245	233	222	212	202
Cohort #19																			289	275	262	250	238	226
Cohort #20																				221	211	201	191	182
Cohort #21																					207	198	188	179
Cohort #22																						220	209	200
Cohort #23																							266	254
Cohort #24																								205
Total Expected Subscribers	4,965	5,006	5,174	5,288	5,351	5,392	5,562	5,690	5,701	5,782	5,257	5,290	5,860	5,345	5,390	5,437	5,424	5,434	5,462	5,422	5,370	5,332	5,343	5,292

Table 5c: U.S. Cellular's Exponential-Gamma (EG) Subscriber Data Structure

EG	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,729	4,504	4,290	4,087	3,893	3,709	3,533	3,367	3,208	3,057	2,913	2,776	2,645	2,521	2,403	2,290	2,183	2,081	1,984	1,892	1,804	1,720	1,640
Cohort #2		273	260	247	235	224	214	204	194	185	176	168	160	152	145	138	132	126	120	114	109	104	99	94
Cohort #3			405	385	367	350	333	317	302	288	274	261	249	237	226	216	205	196	187	178	170	162	154	147
Cohort #4				359	342	326	310	296	282	268	256	244	232	221	211	201	191	182	174	166	158	151	144	137
Cohort #5					314	299	285	271	258	246	234	223	213	203	193	184	175	167	159	152	145	138	131	125
Cohort #6						295	281	268	255	243	232	221	210	200	191	182	173	165	157	150	143	136	130	124
Cohort #7							426	406	386	368	351	334	318	303	289	275	262	250	238	227	216	206	197	187
Cohort #8								393	374	356	339	323	308	293	280	266	254	242	230	220	209	199	190	181
Cohort #9									282	269	256	244	232	221	211	201	191	182	174	165	158	150	143	136
Cohort #10										353	336	320	305	290	277	264	251	239	228	217	207	197	188	179
Cohort #11											(249)	(237)	(226)	(215)	(205)	(195)	(186)	(177)	(169)	(161)	(153)	(146)	(139)	(133)
Cohort #12												285	271	258	246	234	223	213	203	193	184	175	167	159
Cohort #13													822	783	746	710	677	645	614	585	557	531	506	482
Cohort #14														(235)	(224)	(213)	(203)	(193)	(184)	(175)	(167)	(159)	(152)	(144)
Cohort #15																286	272	259	247	235	224	214	204	194
Cohort #16																305	291	277	264	251	239	228	217	207
Cohort #17																	247	235	224	213	203	193	184	176
Cohort #18																		270	257	245	233	222	211	201
Cohort #19																			289	275	262	249	237	226
Cohort #20																				221	211	201	191	182
Cohort #21																					207	198	188	179
Cohort #22																						220	209	199
Cohort #23																							266	254
Cohort #24																								205
Total Expected Subscribers	4,965	5,001	5,168	5,282	5,345	5,387	5,558	5,687	5,700	5,784	5,262	5,298	5,870	5,359	5,407	5,457	5,447	5,461	5,492	5,455	5,407	5,372	5,387	5,339

Table 5d: U.S. Cellular's Weibull-Gamma (WG) Subscriber Data Structure

WG	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,766	4,534	4,304	4,085	3,880	3,690	3,514	3,351	3,200	3,061	2,932	2,813	2,702	2,599	2,503	2,414	2,330	2,252	2,178	2,109	2,044	1,983	1,925
Cohort #2		273	262	249	236	224	213	203	193	184	176	168	161	154	148	143	137	132	128	124	120	116	112	109
Cohort #3			405	388	369	351	333	316	301	286	273	261	249	239	229	220	212	204	197	190	183	177	172	167
Cohort #4				359	345	328	311	296	281	267	254	242	232	221	212	204	196	188	181	175	169	163	158	153
Cohort #5					314	301	286	272	258	245	233	222	212	202	193	185	178	171	164	158	152	147	142	138
Cohort #6						295	283	270	256	243	231	219	209	199	190	182	174	167	161	155	149	144	139	134
Cohort #7							426	409	389	369	351	333	317	302	288	275	263	252	241	232	223	215	207	200
Cohort #8								393	377	359	341	323	307	292	278	265	253	242	232	223	214	206	198	191
Cohort #9									282	271	257	244	232	220	210	200	190	182	174	167	160	153	148	142
Cohort #10										353	339	322	306	290	276	262	250	238	227	218	208	200	192	185
Cohort #11											(249)	(239)	(227)	(216)	(205)	(194)	(185)	(176)	(168)	(160)	(153)	(147)	(141)	(135)
Cohort #12												285	273	260	247	234	222	212	201	192	183	175	168	161
Cohort #13													822	789	751	713	677	643	611	582	555	530	507	486
Cohort #14														(235)	(225)	(214)	(203)	(193)	(183)	(174)	(166)	(158)	(151)	(145)
Cohort #15															300	288	274	260	247	235	223	212	203	193
Cohort #16																305	293	279	265	251	239	227	216	206
Cohort #17																	247	237	225	214	203	193	183	175
Cohort #18																		270	259	246	234	222	211	200
Cohort #19																			289	277	263	250	237	225
Cohort #20																				221	212	202	192	182
Cohort #21																					207	199	189	180
Cohort #22																						220	211	201
Cohort #23																							266	256
Cohort #24																								205
Total Expected Subscribers	4,965	5,039	5,200	5,301	5,350	5,380	5,543	5,671	5,687	5,777	5,267	5,314	5,905	5,422	5,491	5,570	5,591	5,637	5,703	5,701	5,688	5,690	5,742	5,732

Table 5e: U.S. Cellular's 2-Segment Weibull (2W) Subscriber Data Structure

2W_C	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,772	4,518	4,288	4,069	3,803	3,536	3,315	3,116	2,883	2,656	2,472	2,309	2,122	1,942	1,798	1,671	1,528	1,391	1,282	1,188	1,081	980	900
Cohort #2		273	265	261	257	253	249	246	243	240	240	237	234	231	228	226	223	221	218	216	214	211	209	207
Cohort #3			405	395	389	383	376	371	367	361	356	356	352	348	343	339	336	332	328	324	321	317	313	310
Cohort #4				359	352	345	339	334	330	325	320	316	316	312	308	304	301	298	294	291	288	284	281	278
Cohort #5					314	306	300	295	291	287	282	279	276	276	272	269	266	263	259	256	254	251	248	245
Cohort #6						295	288	283	279	274	270	266	263	260	260	257	254	251	247	245	242	239	236	234
Cohort #7							426	417	410	403	396	391	386	381	375	375	371	366	361	357	354	349	345	341
Cohort #8								393	385	377	371	365	361	355	350	346	346	341	337	333	329	325	321	318
Cohort #9									282	275	269	265	262	258	254	251	248	248	244	242	239	236	233	231
Cohort #10										353	344	338	333	328	323	318	315	310	310	307	303	299	296	292
Cohort #11											(243)	(243)	(239)	(235)	(231)	(228)	(225)	(222)	(219)	(219)	(217)	(214)	(211)	(209)
Cohort #12												285	279	273	269	265	261	258	254	251	251	247	244	241
Cohort #13													822	801	786	774	763	752	740	731	723	723	713	704
Cohort #14														(235)	(229)	(225)	(222)	(218)	(215)	(212)	(209)	(206)	(206)	(204)
Cohort #15															300	293	289	284	279	275	272	268	264	264
Cohort #16																305	299	293	288	284	280	276	272	269
Cohort #17																	247	240	236	232	229	226	222	219
Cohort #18																		270	263	258	255	250	247	243
Cohort #19																			289	282	278	273	268	265
Cohort #20																				221	216	212	209	206
Cohort #21																					207	202	198	195
Cohort #22																						220	214	210
Cohort #23																							266	261
Cohort #24																								205
Total Expected Subscribers	4,965	5,044	5,188	5,304	5,381	5,385	5,514	5,654	5,702	5,778	5,255	5,327	5,954	5,475	5,548	5,667	5,743	5,813	5,904	5,956	6,016	6,071	6,161	6,226

Table 5f: U.S. Cellular's 2-Segment Weibull-Gamma (2WG) Subscriber Data Structure

2WG	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,767	4,539	4,306	4,076	3,851	3,634	3,425	3,225	3,035	2,854	2,683	2,521	2,368	2,223	2,087	1,958	1,837	1,724	1,617	1,516	1,422	1,334	1,251
Cohort #2		273	261	252	245	238	232	227	221	216	211	207	202	198	194	190	187	183	179	176	173	170	167	164
Cohort #3			405	387	374	364	354	345	336	328	321	314	307	301	294	288	283	277	272	266	261	257	252	247
Cohort #4				359	344	332	323	314	306	299	292	285	279	273	267	261	256	251	246	241	237	232	228	224
Cohort #5					314	300	290	282	274	267	261	255	249	243	238	233	228	224	219	215	211	207	203	199
Cohort #6						295	282	273	265	258	252	246	240	234	229	224	219	215	210	206	202	198	194	191
Cohort #7							426	407	394	383	373	363	354	346	338	331	323	317	310	304	298	292	286	281
Cohort #8								393	376	364	353	344	335	327	319	312	305	298	292	286	280	274	269	264
Cohort #9									282	270	261	253	247	240	234	229	224	219	214	210	205	201	197	193
Cohort #10										353	337	327	317	309	301	293	287	280	274	268	262	257	252	246
Cohort #11											(249)	(238)	(230)	(224)	(218)	(212)	(207)	(202)	(197)	(193)	(189)	(185)	(181)	(177)
Cohort #12												285	272	263	256	249	243	237	231	226	221	216	211	207
Cohort #13													822	786	761	739	719	701	684	668	652	638	624	611
Cohort #14														(235)	(224)	(217)	(211)	(205)	(200)	(195)	(191)	(186)	(182)	(178)
Cohort #15															300	287	278	270	263	256	250	244	238	233
Cohort #16																305	292	283	274	267	260	254	248	242
Cohort #17																	247	236	228	222	216	210	205	200
Cohort #18																		270	258	250	242	236	230	224
Cohort #19																			289	276	267	259	252	246
Cohort #20																				221	211	205	199	193
Cohort #21																					207	198	192	186
Cohort #22																						220	210	203
Cohort #23																							266	255
Cohort #24																								205
Total Expected Subscribers	4,965	5,039	5,204	5,304	5,352	5,381	5,541	5,666	5,681	5,773	5,267	5,323	5,915	5,430	5,513	5,600	5,630	5,688	5,769	5,785	5,793	5,818	5,894	5,910

Table 5g: U.S. Cellular's 2-Segment Weibull with Covariates (2W_C) Subscriber Data Structure

2W_C	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,772	4,518	4,288	4,069	3,803	3,536	3,315	3,116	2,883	2,656	2,472	2,309	2,122	1,942	1,798	1,671	1,528	1,391	1,282	1,188	1,081	980	900
Cohort #2		273	265	246	257	253	249	246	243	240	240	237	234	231	228	226	223	221	218	216	214	211	209	207
Cohort #3			405	395	389	383	376	371	367	361	356	356	352	348	343	339	336	332	328	324	321	317	313	310
Cohort #4				359	352	345	339	334	330	325	320	316	316	312	308	304	301	298	294	291	288	284	281	278
Cohort #5					314	306	300	295	291	287	282	279	276	276	272	269	266	263	259	256	254	251	248	245
Cohort #6						295	288	283	279	274	270	266	263	260	260	257	254	251	247	245	242	239	236	234
Cohort #7							426	417	410	403	396	391	386	381	375	375	371	366	361	357	354	349	345	341
Cohort #8								393	385	377	371	365	361	355	350	346	346	341	337	333	329	325	321	318
Cohort #9									282	275	269	265	262	258	254	251	248	248	244	242	239	236	233	231
Cohort #10										353	344	338	333	328	323	318	315	310	310	307	303	299	296	292
Cohort #11											(249)	(243)	(239)	(235)	(231)	(228)	(225)	(222)	(219)	(219)	(217)	(214)	(211)	(209)
Cohort #12												285	279	273	269	265	261	258	254	251	251	247	244	241
Cohort #13													822	801	786	774	763	752	740	731	723	723	713	704
Cohort #14														(235)	(229)	(225)	(222)	(218)	(215)	(212)	(209)	(206)	(206)	(204)
Cohort #15															300	293	289	284	279	275	272	268	264	264
Cohort #16																305	299	293	288	284	280	276	272	269
Cohort #17																	247	240	236	232	229	226	222	219
Cohort #18																		270	263	258	255	250	247	243
Cohort #19																			289	282	278	273	268	265
Cohort #20																				221	216	212	209	206
Cohort #21																					207	202	198	195
Cohort #22																						220	214	210
Cohort #23																							266	261
Cohort #24																								205
Total Expected Subscribers	4,965	5,044	5,188	5,304	5,381	5,385	5,514	5,654	5,702	5,778	5,255	5,327	5,954	5,475	5,548	5,667	5,743	5,813	5,904	5,956	6,016	6,071	6,161	6,226

Table 5h: U.S. Cellular's 2-Segment Weibull-Gamma with Covariates (2WG_C) Subscriber Data Structure

2WG_C	2006				2007				2008				2009				2010				2011			
U.S. CELLULAR	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		273	405	359	314	295	426	393	282	353	(249)	285	822	(235)	300	305	247	270	289	221	207	220	266	205
Actual Postpaid Subscribers	4,965	5,013	5,188	5,311	5,384	5,420	5,502	5,644	5,688	5,766	5,269	5,331	5,884	5,379	5,420	5,480	5,448	5,456	5,482	5,473	5,451	5,426	5,416	5,394
Cohort #1	4,965	4,772	4,524	4,299	4,090	3,836	3,582	3,372	3,185	2,967	2,753	2,580	2,429	2,254	2,085	1,949	1,831	1,696	1,566	1,462	1,373	1,270	1,172	1,093
Cohort #2		273	261	254	250	244	239	235	232	228	228	225	222	219	215	213	210	207	205	202	200	198	195	193
Cohort #3			405	389	381	372	364	357	352	346	340	340	335	330	325	321	317	313	308	305	302	298	294	291
Cohort #4				359	347	337	329	323	318	312	306	302	302	297	292	288	285	281	277	274	271	267	264	261
Cohort #5					314	300	292	286	281	276	270	266	262	262	258	255	251	248	244	241	239	235	232	230
Cohort #6						295	282	276	270	265	259	255	251	247	247	244	241	237	233	231	228	225	222	219
Cohort #7							426	410	401	392	383	376	371	364	358	358	353	348	342	338	334	329	325	321
Cohort #8								393	379	369	360	353	348	341	335	330	330	325	320	315	312	307	303	299
Cohort #9									282	270	263	257	253	248	243	239	236	236	232	229	226	223	220	217
Cohort #10										353	338	329	323	316	310	305	301	295	295	291	288	283	279	276
Cohort #11											(249)	(239)	(234)	(229)	(224)	(220)	(216)	(213)	(209)	(209)	(206)	(203)	(200)	(197)
Cohort #12												285	275	267	261	256	252	247	243	239	239	235	232	229
Cohort #13													822	788	766	750	737	722	709	698	688	688	677	667
Cohort #14														(235)	(225)	(219)	(215)	(210)	(206)	(203)	(200)	(196)	(196)	(194)
Cohort #15															300	289	283	276	270	265	261	257	252	252
Cohort #16																305	295	287	280	275	270	265	260	257
Cohort #17																	247	236	230	225	221	217	213	209
Cohort #18																		270	258	252	247	242	237	233
Cohort #19																			289	278	272	265	259	255
Cohort #20																				221	213	208	203	199
Cohort #21																					207	199	193	189
Cohort #22																						220	210	205
Cohort #23																							266	256
Cohort #24																								205
Total Expected Subscribers	4,965	5,045	5,189	5,302	5,380	5,386	5,516	5,652	5,701	5,777	5,252	5,329	5,999	5,471	5,548	5,663	5,737	5,802	5,886	5,929	5,984	6,031	6,111	6,164

Table 6a: AT&T's Exponential (E) Subscriber Data Structure

E	2009				2010				2011			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,491	56,516	54,607	52,763	50,982	49,260	47,597	45,989	44,436	42,936	41,486
Cohort #2		3,073	2,969	2,869	2,772	2,678	2,588	2,501	2,416	2,335	2,256	2,180
Cohort #3			3,445	3,328	3,216	3,107	3,003	2,901	2,803	2,709	2,617	2,529
Cohort #4				3,867	3,736	3,610	3,488	3,370	3,257	3,147	3,040	2,938
Cohort #5					2,563	2,477	2,393	2,312	2,234	2,159	2,086	2,015
Cohort #6						3,863	3,733	3,606	3,485	3,367	3,253	3,143
Cohort #7							3,021	2,919	2,820	2,725	2,633	2,544
Cohort #8								2,694	2,603	2,515	2,430	2,348
Cohort #9									2,430	2,348	2,269	2,192
Cohort #10										2,644	2,555	2,469
Cohort #11											2,624	2,535
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,564	62,930	64,672	65,051	66,717	67,485	67,900	68,038	68,384	68,699	69,577

Table 6b: AT&T's Weibull (W) Subscriber Data Structure

W	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,588	56,639	54,731	52,872	51,065	49,311	47,611	45,963	44,367	42,823	41,329
Cohort #2		3,073	2,974	2,875	2,778	2,684	2,592	2,503	2,417	2,333	2,252	2,174
Cohort #3			3,445	3,334	3,223	3,115	3,009	2,906	2,806	2,709	2,616	2,525
Cohort #4				3,867	3,743	3,618	3,496	3,377	3,262	3,150	3,041	2,936
Cohort #5					2,563	2,481	2,398	2,318	2,239	2,162	2,088	2,016
Cohort #6						3,863	3,739	3,614	3,493	3,374	3,259	3,147
Cohort #7							3,021	2,924	2,826	2,731	2,638	2,548
Cohort #8								2,694	2,608	2,521	2,436	2,353
Cohort #9									2,430	2,352	2,274	2,197
Cohort #10										2,644	2,559	2,474
Cohort #11											2,624	2,539
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,661	63,058	64,808	65,179	66,826	67,566	67,947	68,043	68,344	68,609	69,436

Table 6c: AT&T's Exponential-Gamma (EG) Subscriber Data Structure

EG	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,490	56,515	54,606	52,762	50,981	49,259	47,596	45,989	44,437	42,937	41,487
Cohort #2		3,073	2,969	2,869	2,772	2,678	2,588	2,501	2,416	2,335	2,256	2,180
Cohort #3			3,445	3,328	3,216	3,107	3,002	2,901	2,803	2,709	2,617	2,529
Cohort #4				3,867	3,736	3,610	3,488	3,370	3,257	3,147	3,040	2,938
Cohort #5					2,563	2,477	2,393	2,312	2,234	2,159	2,086	2,015
Cohort #6						3,863	3,733	3,606	3,485	3,367	3,253	3,143
Cohort #7							3,021	2,919	2,820	2,725	2,633	2,544
Cohort #8								2,694	2,603	2,515	2,430	2,348
Cohort #9									2,430	2,348	2,269	2,192
Cohort #10										2,644	2,555	2,469
Cohort #11											2,624	2,535
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,563	62,929	64,671	65,050	66,716	67,484	67,900	68,037	68,384	68,700	69,579

Table 6d: AT&T's Weibull-Gamma (WG) Subscriber Data Structure

WG	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,589	56,640	54,731	52,872	51,065	49,311	47,610	45,963	44,367	42,823	41,329
Cohort #2		3,073	2,974	2,875	2,778	2,684	2,592	2,503	2,417	2,333	2,252	2,174
Cohort #3			3,445	3,334	3,223	3,115	3,009	2,906	2,806	2,709	2,616	2,525
Cohort #4				3,867	3,743	3,618	3,496	3,377	3,262	3,150	3,041	2,936
Cohort #5					2,563	2,481	2,398	2,318	2,239	2,162	2,088	2,016
Cohort #6						3,863	3,739	3,614	3,493	3,374	3,259	3,147
Cohort #7							3,021	2,924	2,826	2,731	2,638	2,548
Cohort #8								2,694	2,608	2,521	2,436	2,353
Cohort #9									2,430	2,352	2,274	2,197
Cohort #10										2,644	2,559	2,474
Cohort #11											2,624	2,539
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,662	63,059	64,808	65,179	66,825	67,566	67,946	68,043	68,344	68,610	69,437

Table 6e: AT&T's 2-Segment Weibull (2W) Subscriber Data Structure

2W	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,647	56,518	54,342	52,167	50,020	47,913	45,857	43,856	41,916	40,038	38,224
Cohort #2		3,073	3,072	3,068	3,055	3,028	2,982	2,911	2,812	2,683	2,521	2,329
Cohort #3			3,445	3,444	3,439	3,425	3,394	3,342	3,263	3,153	3,007	2,826
Cohort #4				3,867	3,866	3,861	3,844	3,810	3,752	3,663	3,539	3,376
Cohort #5					2,563	2,563	2,559	2,548	2,526	2,487	2,428	2,346
Cohort #6						3,863	3,862	3,857	3,840	3,806	3,748	3,659
Cohort #7							3,021	3,020	3,016	3,003	2,976	2,931
Cohort #8								2,694	2,694	2,690	2,678	2,655
Cohort #9									2,430	2,430	2,426	2,416
Cohort #10										2,644	2,644	2,640
Cohort #11											2,624	2,623
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,720	63,035	64,721	65,091	66,759	67,575	68,039	68,189	68,475	68,631	69,224

Table 6f: AT&T's 2-Segment Weibull-Gamma (2WG) Subscriber Data Structure

2WG	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,541	56,422	54,304	52,217	50,175	48,186	46,253	44,379	42,565	40,812	39,120
Cohort #2		3,073	3,073	3,072	3,059	2,983	2,851	2,724	2,617	2,526	2,448	2,381
Cohort #3			3,445	3,445	3,444	3,429	3,344	3,196	3,054	2,933	2,832	2,745
Cohort #4				3,867	3,867	3,866	3,849	3,754	3,588	3,428	3,293	3,179
Cohort #5					2,563	2,563	2,563	2,552	2,488	2,378	2,272	2,183
Cohort #6						3,863	3,863	3,862	3,845	3,750	3,584	3,425
Cohort #7							3,021	3,021	3,020	3,007	2,932	2,803
Cohort #8								2,694	2,694	2,694	2,682	2,616
Cohort #9									2,430	2,430	2,430	2,419
Cohort #10										2,644	2,644	2,644
Cohort #11											2,624	2,624
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,614	62,940	64,688	65,151	66,880	67,677	68,056	68,116	68,356	68,554	69,334

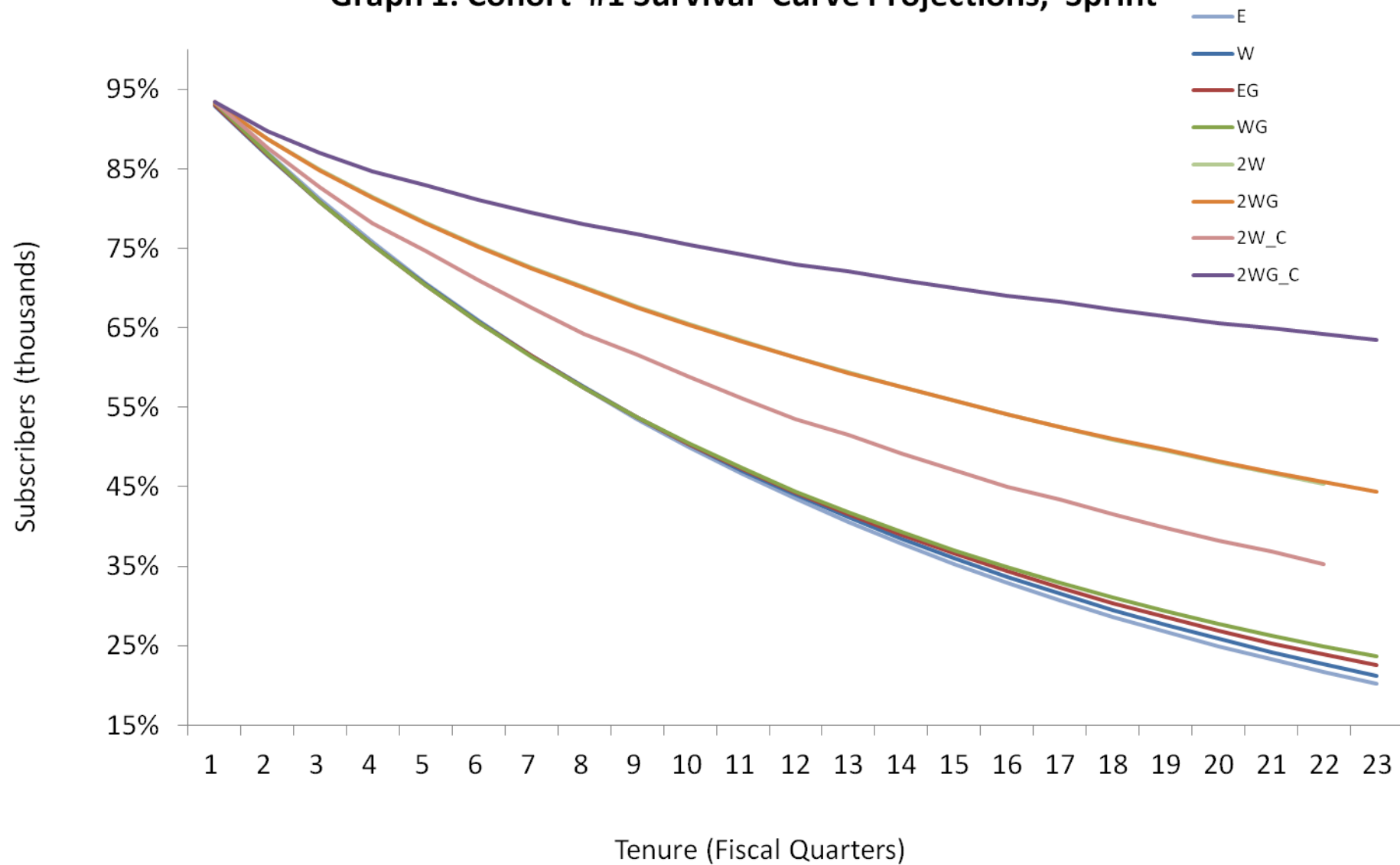
Table 6g: AT&T's 2-Segment Weibull with Covariates (2W_C) Subscriber Data Structure

2W_C	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,556	56,471	54,420	52,481	50,729	48,903	47,113	45,424	43,900	42,313	40,758
Cohort #2		3,073	3,042	2,978	2,892	2,796	2,680	2,552	2,420	2,291	2,290	2,137
Cohort #3			3,445	3,410	3,339	3,249	3,134	3,001	2,861	2,722	2,567	2,566
Cohort #4				3,867	3,828	3,754	3,646	3,514	3,368	3,221	3,053	2,876
Cohort #5					2,563	2,539	2,486	2,413	2,328	2,238	2,133	2,019
Cohort #6						3,863	3,824	3,743	3,636	3,515	3,369	3,208
Cohort #7							3,021	2,990	2,928	2,849	2,748	2,632
Cohort #8								2,694	2,667	2,616	2,540	2,448
Cohort #9									2,430	2,407	2,357	2,288
Cohort #10										2,644	2,618	2,562
Cohort #11											2,624	2,597
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,629	62,958	64,674	65,104	66,931	67,694	68,021	68,062	68,404	68,610	69,289

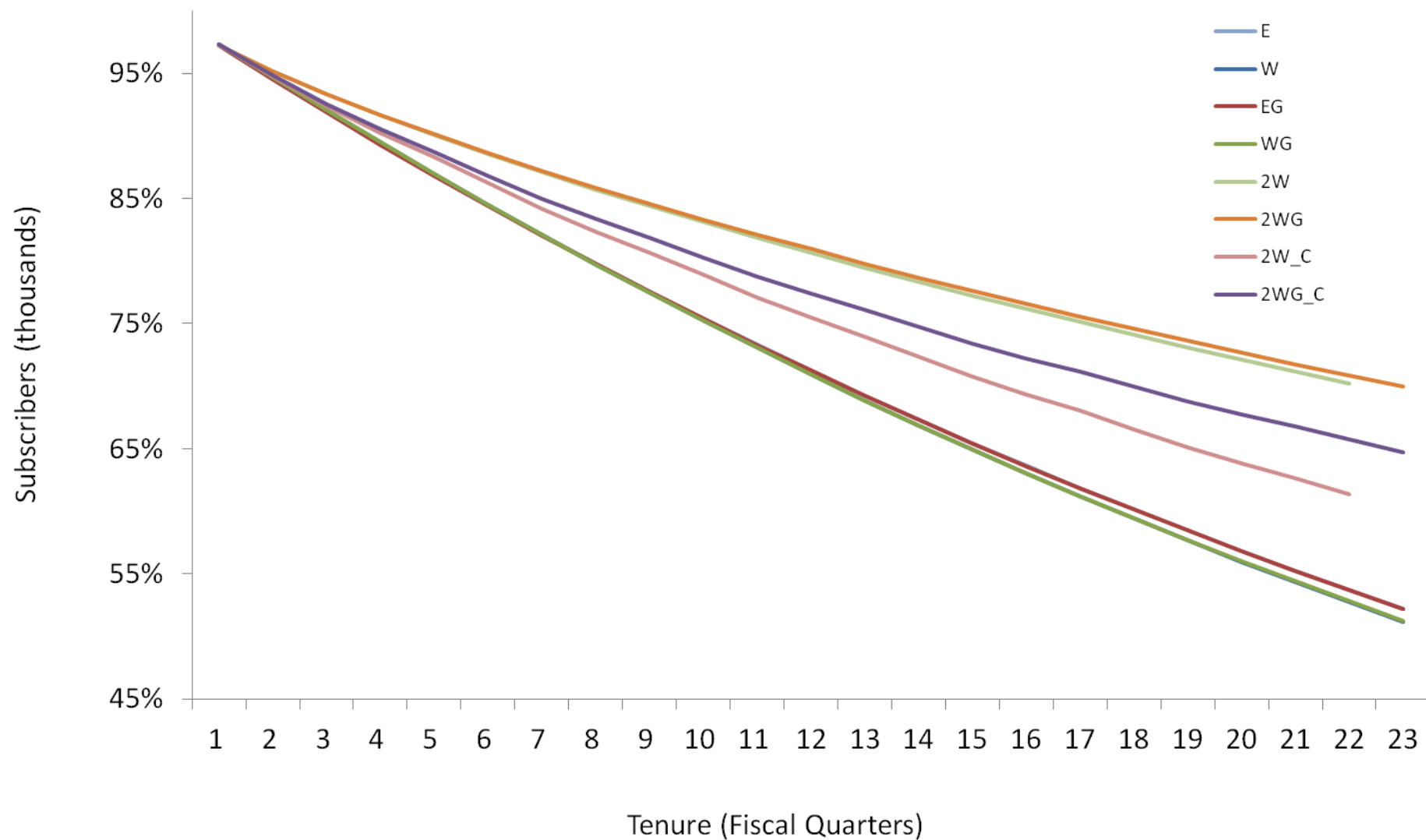
Table 6h: AT&T's 2-Segment Weibull-Gamma with Covariates (2WG_C) Subscriber Data Structure

2WG_C	2006				2007				2008			
AT&T	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Implied Gross Wireless Additions-Postpaid		3,073	3,445	3,867	2,563	3,863	3,021	2,694	2,430	2,644	2,624	3,198
Actual Postpaid Subscribers	60,535	61,647	62,961	64,627	65,108	66,970	67,688	68,041	68,062	68,353	68,614	69,309
Cohort #1	60,535	58,552	56,471	54,429	52,508	50,776	48,973	47,208	45,548	44,054	42,498	40,975
Cohort #2		3,073	3,040	2,970	2,879	2,779	2,657	2,525	2,390	2,262	2,261	2,109
Cohort #3			3,445	3,407	3,331	3,236	3,114	2,975	2,831	2,690	2,534	2,532
Cohort #4				3,867	3,825	3,746	3,630	3,491	3,340	3,188	3,017	2,839
Cohort #5					2,563	2,538	2,480	2,403	2,313	2,219	2,110	1,995
Cohort #6						3,863	3,821	3,734	3,620	3,493	3,340	3,174
Cohort #7							3,021	2,987	2,921	2,837	2,730	2,609
Cohort #8								2,694	2,665	2,610	2,529	2,432
Cohort #9									2,430	2,406	2,352	2,278
Cohort #10										2,644	2,616	2,556
Cohort #11											2,624	2,595
Cohort #12												3,198
Cohort #13												
Cohort #14												
Cohort #15												
Cohort #16												
Cohort #17												
Cohort #18												
Cohort #19												
Cohort #20												
Cohort #21												
Cohort #22												
Cohort #23												
Cohort #24												
Total Expected Subscribers	60,535	61,625	62,956	64,673	65,106	66,937	67,696	68,017	68,057	68,402	68,610	69,293

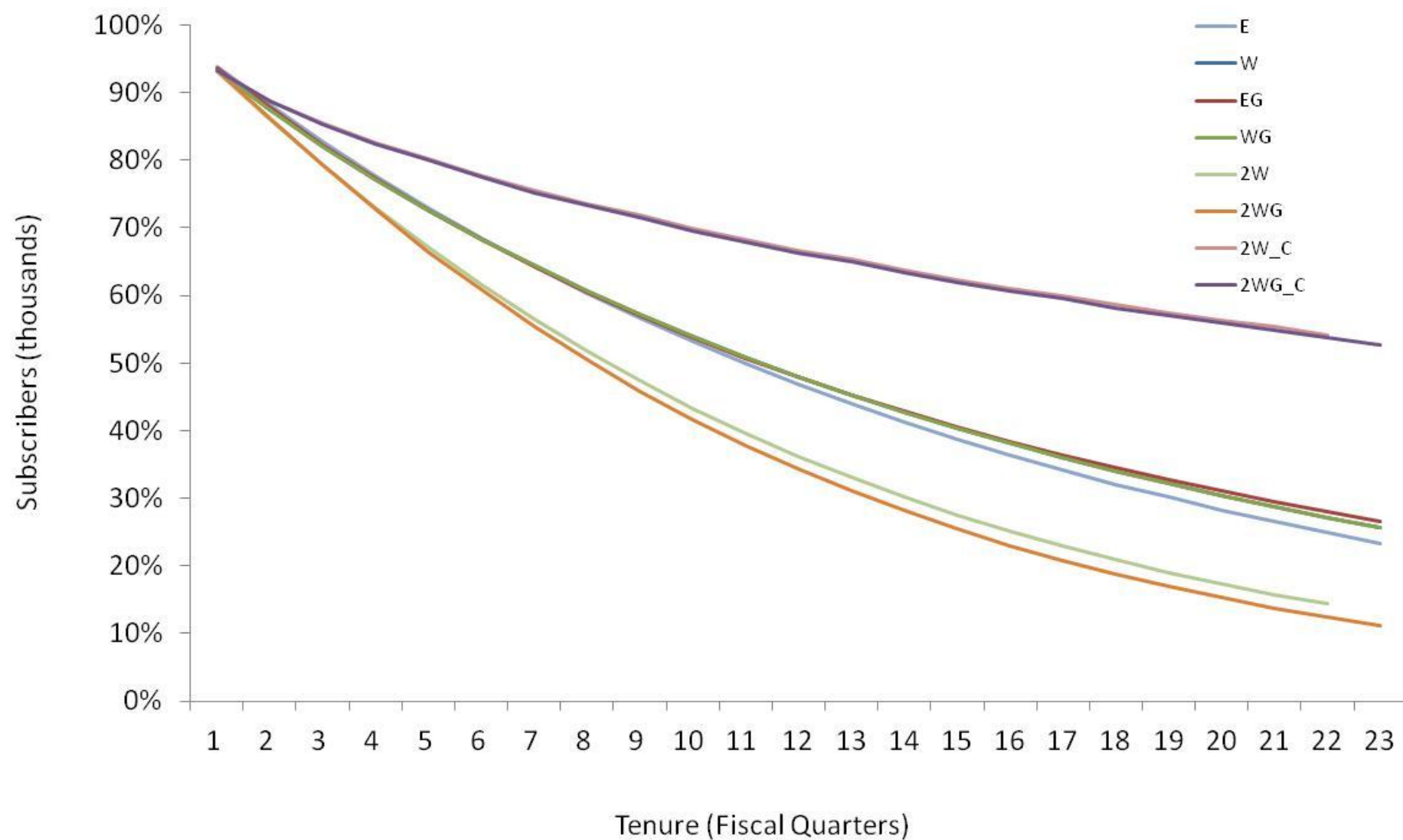
Graph 1: Cohort #1 Survival Curve Projections, Sprint



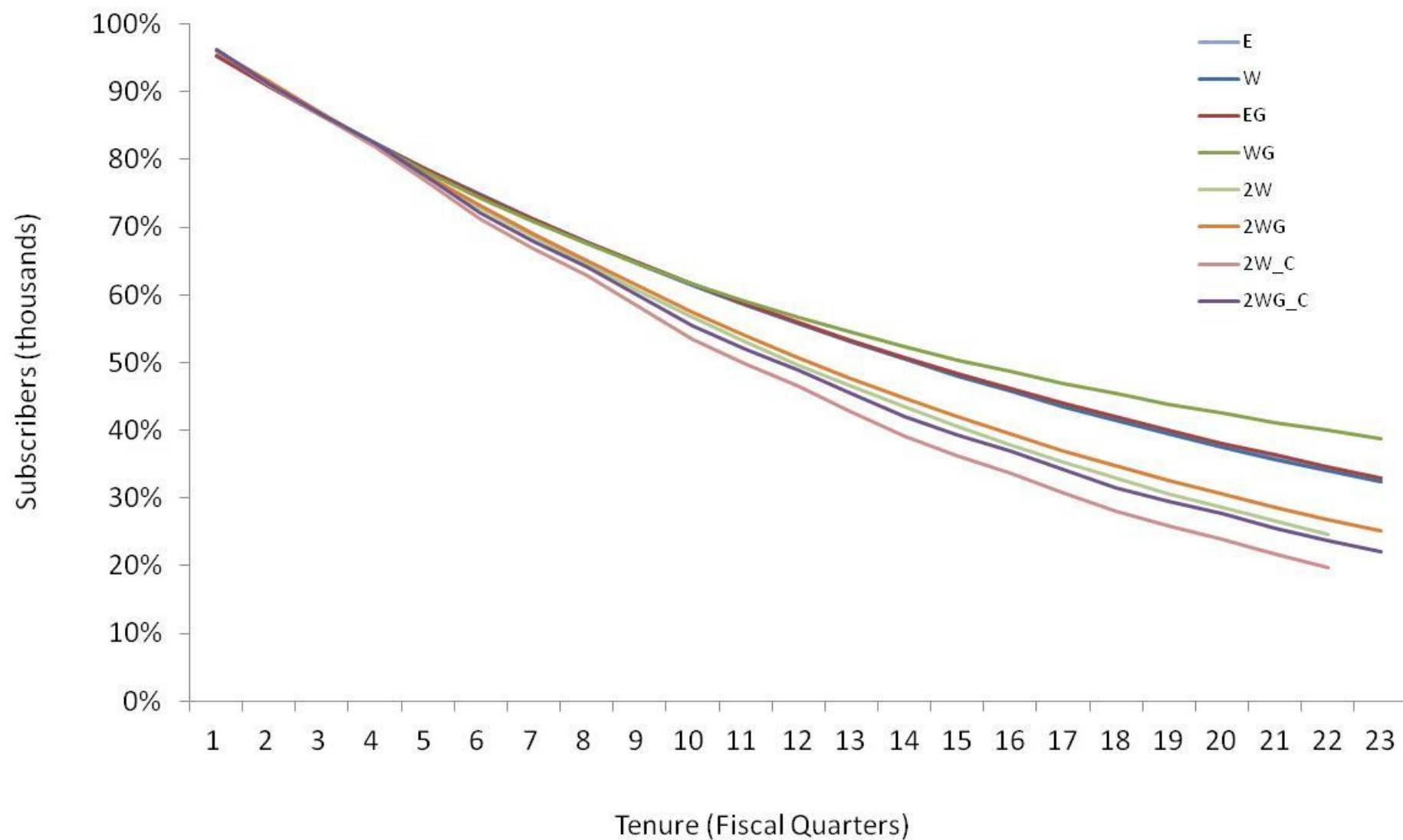
Graph 2: Cohort #1 Survival Curve Projections, Verizon



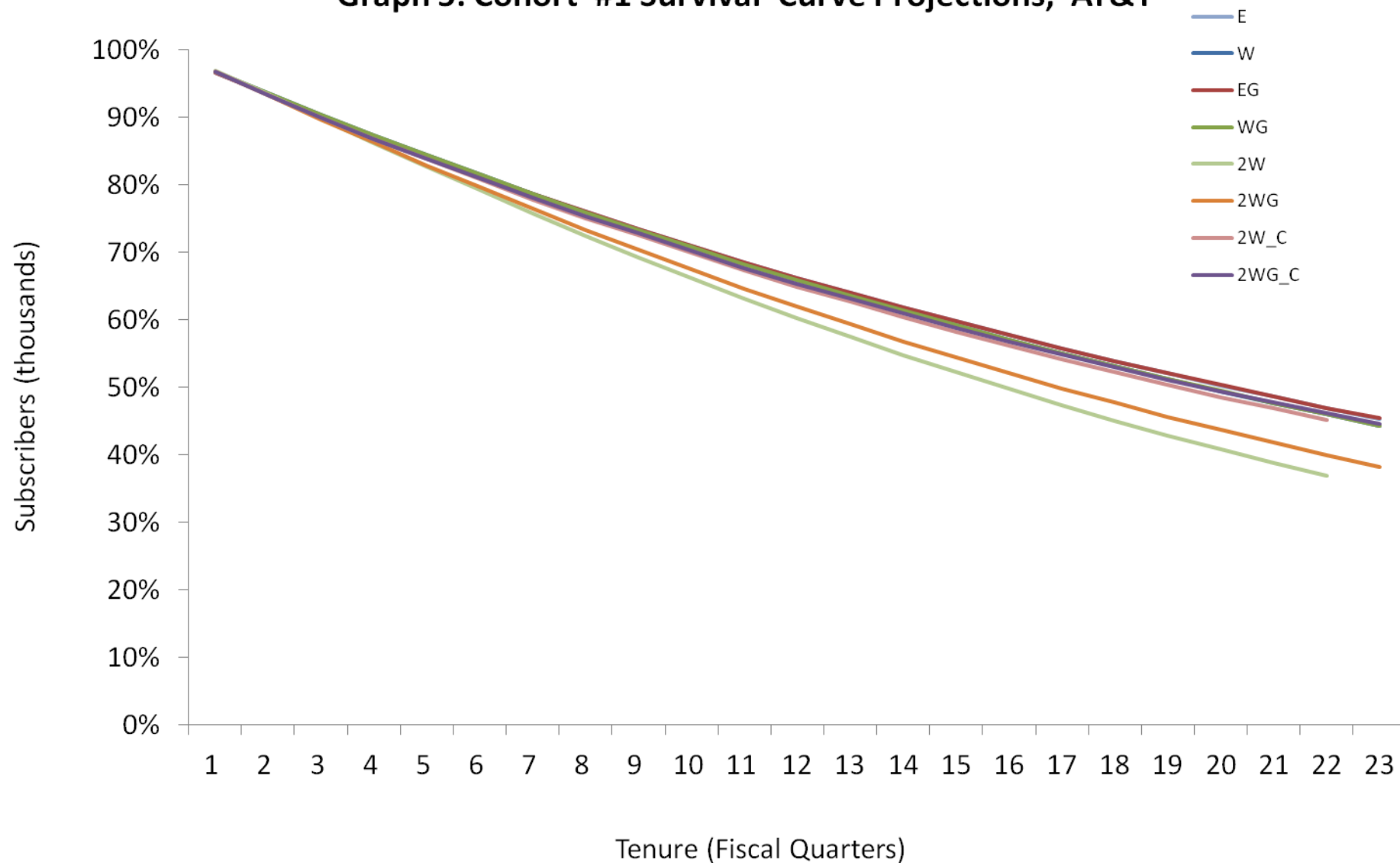
Graph 3: Cohort #1 Survival Curve Projections, T-Mobile



Graph 4: Cohort #1 Survival Curve Projections, U.S. Cellular



Graph 5: Cohort #1 Survival Curve Projections, AT&T



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